A case study of two producer organisations in Papua New Guinea: Lessons for cooperative policy and legislation

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Papua New Guinea recently revived its cooperative movement to drive rural development initiatives that rely on producer organisations to link small farmers to markets. The demise of the country's first cooperative movement was attributed to inadequate capital and poor management. The New Institutional Economics theory suggests that these problems may only be symptoms of weak institutional and governance arrangements that characterise traditional cooperatives. This research examined the institutional and governance arrangements of two producer organisations in Papua New Guinea and analysed the impact of these arrangements on the achievement of their intended business strategies. The main purpose of this research is to inform the development of cooperative policy and legislation in the country. The timing of this study is opportune as the government is drafting new policy to guide amendments to Papua New Guinea's 1982 Cooperative Societies Act.

A qualitative, case study method was used to gather and analyse data. Two producer organisations established to process and market commodities produced by small farmers were selected as units of analysis. These organisations, a cocoa cooperative and a rubber company, differed in their value adding performance despite similarities in their patron (farmer) members and markets. Analysis followed a pattern matching approach to test propositions relating performance to institutional and governance arrangements.

The low performing cocoa cooperative had investor unfriendly institutional arrangements that prevented its patron members from realising future capital gains. This not only discouraged investment but also encouraged members to take advantage of short-term

opportunities by side selling to other buyers. In contrast, the high performing rubber company adopted investor friendly institutional arrangements. These arrangements were extended to strategic partners who contributed capital, market contracts, and expertise. While both organisations separated ownership from control, the cocoa cooperative was unable to take full advantage of centralised decision-making as it lacked competent directors and managers.

For policy makers, it is recommended that cooperatives be allowed to issue non-redeemable, appreciable and tradable class B shares to farmers and strategic partners, but with restrictions placed on voting rights (to prevent partners from gaining majority control) and a code of conduct to safeguard the interests of farmers. For directors and managers, it is recommended that class B shares be sold to farmers as tradable delivery rights, or issued to farmers as tradable delivery rights 'stapled' to their membership shares. For donors, including government agencies, it is recommended that fledgling producer organisations should qualify for the same level of support regardless of their juristic status.

Keywords: Institutional and governance arrangements, value adding performance, investor share cooperative, cooperative legislation, small farmers, producer organisations.

Dedicate to

my loving mother, Mrs Marilyne Mwayawa,

may your soul rest in peace

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To my Mum, I dedicate this thesis. I lost my Mum during the course of this research. I am forever grateful for her loving and caring heart, and her prayers and faith that brought me this far in life. My family and friends in PNG and Lincoln were a tower of strength during this difficult time and encouraged me to keep working. I owe them all a debt of gratitude.

To God be the glory the creator of the heavens and earth, the source of all knowledge and understanding.

List of Contents

Contents

List of Tables, Figures and Images

Tables **Page**

Figures

Images

Abbreviations

ACIAR - Australian Centre for International Agriculture Research

AGM - Annual General Meetings

BoD - Board of Directors

BPNG - Bank of Papua New Guinea

CCI - Cocoa and Coconut Institute

CPB - Cocoa Pod Borer

CSA - Cooperative Society Act

CSU - Cooperative Society Unit

EDRG - Export Driven Recovery and Growth

ICA - International Cooperative Alliance

ILG - Incorporated Land Group

IOF - Investor Owned Firms

ISC - Investor Share Cooperatives

MIC - Member Investment Cooperatives

MTI - Ministry of Trade and Industry

NGC - New Generation Cooperatives

NIE - New Institutional Economics

PIC - Proportional Investment Cooperatives

PNG - Papua New Guinea

PNGCR10 - PNG Classified Rubber (grade 10)

PNGDAL - Papua New Guinea Department of Agriculture and Livestock

RIS - Research Information Sheet

SME - Small and Medium Enterprise

TSR - Technically Specified Rubber

UN - United Nations

UNHLTF - United Nations High Level Task Force

Chapter 1

Introduction

This chapter presents background information on agriculture in Papua New Guinea (PNG) and the role of small farmers. This is followed by a brief description of the cooperative movement in PNG, reasons for this study, and an outline of the thesis.

1.1. Agriculture in PNG and the role of small farmers

PNG is an agrarian society. Agriculture provides income for about 80% of its population (Hanson, Allen, Bourke, & MacCarthy, 2001) and the sector accounts for 72% of employment (Asian Development Bank [ADB], 2012) and 17% of GDP (Allen, Bourke, & McGregor, 2009). The main agriculture commodities are palm oil, coffee, cocoa, copra oil, tea and rubber. According to statistics from the Bank of PNG (BPNG) (2015) palm oil accounted for 45% of the total value of agricultural exports in 2015. This is followed by coffee and cocoa with 21% and 14% respectively. Other crops such as copra, tea and rubber made up most of the remaining 20%.

Small farmers produce most of these crops. They produce up to 85% of the coffee, 87% of the cocoa, 80% of copra oil and 35% of the palm oil (PNGDAL, 2007). These shares have increased in recent years (with the exception of oil palm) as production on estate plantations diminished in response to rising labour costs and conflict over land (Allen et al., 2009; Australian Centre for International Agriculture Research [ACIAR], 2007; Komolong, Omuru, & Mbabu, 2012; Omuru & Kingwell, 2000; PNG Coffee Industry Cooperation [PNGCIC], 2004, 2008). This change in the structure of the agricultural sector has been accompanied by a decline in total production of export crops (Allen et al., 2009; Komolong et al., 2012). Poor performance in export crops has also been attributed to volatile commodity prices (Galgal & Kara, 2010; Gwaiseuk, 2001), weak physical and institutional infrastructure (Batt & Murray-Prior, 2011; Komolong et al., 2012), high transport, information and transaction costs (ACIAR, 2007; Batt & Murray-Prior, 2011), and inconsistency in smallholder supply and quality (Gwaiseuk, 2001; Allen et al., 2009; Batt & Murray-Prior, 2011).

While export crops are important to many smallholders, the vast majority of small farmers are subsistence growers that engage only with local markets if and when they produce a surplus (Bourke, 2001; Thompson, 1986). These subsistence households would have suffered a double blow when food prices increased in 2007 as they were not linked to global or even domestic markets and therefore did not benefit from higher product prices, yet confronted these higher prices as consumers of imported food staples like rice. Internationally, the 2007 food price crisis increased the number of food insecure people from 500 million to 1.2 billion (United Nations [UN], 2009). In 2008, the United Nations responded to the crisis with emergency relief and recommendations to improve global food security (United Nations High Level Task Force [UNHLTF], 2008). Foremost among these was a recommendation to promote producer organisations to link smallholders to markets (UNHLTF, 2008).

Small farmers are seldom able to access high value, niche and domestic markets. This is due, in part, to high unit costs of transport, marketing, compliance, and transacting. They are also unable to finance value-adding assets and related certification schemes, and as individuals they lack bargaining power when negotiating contractual terms and conditions (Birthal & Joshi, 2007; Lyne & Martin, 2009; Markelova, Meinzen-Dick, Hellin, & Dohrn, 2009). In theory, producer organisations such as marketing cooperatives help to strengthen bargaining power and to reduce unit costs and risk by pooling farmers' output, and facilitate financing by pooling farmers' capital (Narrod et al., 2009).

Like many other developing countries, PNG is attempting to revive its cooperative movement (Lyne, 2012) and its latest strategies for rural development rely heavily on producer organisations, especially agricultural marketing cooperatives (PNG Department of Agriculture and Livestock [PNGDAL], 2009). Cooperatives are expected to facilitate the implementation of the Small and Medium Enterprise policy (Cooperative Society Unit [CSU], 2008). This policy supports the participation of rural and indigenous communities in economic development. In addition, cooperatives are expected to support the Export Driven Economic Recovery Policy (CSU, 2008) by linking farmers to export markets.

However, cooperatives do not have a good track record in PNG. PNG's first cooperative movement collapsed in the early 1970s (Mugambwa, 2005; CSU, 2008). In 1972, a committee of inquiry attributed this collapse to poor management, inadequate capital and weak support from the Australian Colonial Administration (Lyne, 2012). The plan to revitalise cooperatives involves dedicated support through subsidised capital, training, ongoing extension services, and audit services (CSU, 2008). Of concern is that this approach is very similar to the strategy pursued by the Australian Colonial Administration in the 1960s, and is built on cooperative legislation that does not support the successful cooperative models that emerged in the USA, Europe and New Zealand during the 1990s and early 2000s (Chaddad & Cook, 2004; Harris, Stefanson, & Fulton, 1996; van Bekkum & Bijman 2006; Woodford, 2008).

The New Institutional Economics (NIE) literature argues that the problems of inadequate capital and poor management encountered in traditional cooperatives are often the symptoms of much more fundamental problems created by their weak institutional and governance arrangements (Cook, 1995: Cook & Iliopoulus 1999, 2000; Royer, 1999). In view of the efficiency advantages that marketing cooperatives can exploit as producer-owned and controlled organisations (Sykuta & Cook, 2001) and the role that these organisations are expected to play in PNG's development, it is crucial that PNG's cooperative legislation be reviewed and amended if it precludes cooperative models that are less prone to the institutional problems afflicting traditional cooperatives. This research will examine the institutional and governance arrangements of producer organisations in PNG, and will analyse the impact of these arrangements on the achievement of intended business strategies. The purpose of the research is to inform cooperative policy and legislation in PNG. The timing of this study is opportune as the CSU has been mandated to draft a 'Cooperative Societies Development Policy' and to amend PNG's 1982 Cooperative Societies Act to align with, and support the new policy (CSU, 2008).

1.2. The cooperative movement in PNG

PNG's cooperative movement began in 1947 when the country was administered by Australia. The movement was part of Australia's effort to encourage economic and social

development amongst its indigenous population (Mugambwa, 2005). Under the auspices of the United Nations, Australia and many other colonisers were expected to support the development of indigenous communities. The Australian Administration in its endeavours to achieve this considered cooperatives ideal for PNG, due to its self-regulating village-based societies. To support this, the Native Society Ordinance was enacted. This was later converted to the Cooperative Society Ordinance of 1965.

Interest in the cooperative movement grew rapidly in the 1950s and 1960s. Initially the movement started with villagers who were organised into groups to operate trade stores. This later advanced into large operations involved in agricultural marketing (Singh, 1974). By the mid-1960s, 53% of coffee and 25% of copra production was exported through cooperatives (Singh, 1974). Interest in cooperatives was also evident in the increase in membership. Singh (1974) reported that there were a total 259 registered cooperatives with a membership of 74,000 individuals in 1962. This increased to 349 cooperatives and 129,000 members in 1969 (Singh, 1974).

Despite growing interest in cooperatives, there were already signs of failure by the early 1970s. A Committee of Inquiry was mandated to investigate these failures in 1971. The Committee reported that 92 out of 266 primary cooperative made losses for three consecutive years from 1969 to 1971 and of these 53 cooperatives were in the process of liquidation and another 20 were out of business (Report of Committee of Inquiry into cooperative in PNG, 1972). It attributed the failures to poor management, inadequate capital and weak support from the Australian Colonial Administration (Singh, 1974; Mugambwa, 2005). Poor management was mainly related to misuse of funds and incompetence of managers and directors (Mugambwa, 2005). There was no training provided for the directors (Singh, 1974), who appeared to be uneducated farmers expected to make off-farm decisions. Managers were supposed to provide a supportive role in the absence of a strong leadership from the directors (Mugambwa, 2005), however, this was lacking. Singh (1974) also reported that there was insufficient capital for expansion and growth after initiating the business. Cooperatives were required to apply for loans from commercial banks. In addition, the Australian administration did not have clear and coherent policies to guide the operations of the cooperatives (Mugambwa, 2005). Signs of

weak policy were evident in the inadequate staffing and incompetent officers mandated to oversee the administration of the cooperatives. The administration disregarded the need to train and educate officers in cooperative management (Mugambwa, 2005). Along with this problem was competition from companies that provided attractive pricing which caused disloyalty among members of the cooperatives (Mugambwa, 2005).

Although the Committee had commended the role of cooperatives in social and economic development and put in place strong recommendations to foster improvement, the newly formed government of PNG was not in favour of cooperatives. Soon after Independence the government withdrew support for cooperatives and shifted its focus to the Incorporated Land Group (ILG) to commercialise customary land (Mugambwa, Amankwah and val Hynes, 2007). The Cooperative Ordinance of 1965 was repealed and all existing cooperatives were converted into companies, under the Companies Act of 1965 (Mugambwa, 2005).
By 1980, the government reversed its decision to support the resuscitating of cooperatives. Its rationale was that the Cooperative Society Act allowed for a wider spectrum of membership and therefore provided more opportunities for economic development compared to ILGs (Mugambwa et al, 2007). The Cooperative Society Act was enacted in 1982 to support this decision (Mugambwa, 2005). The 1982 Act is under scrutiny but, at the time of writing, remains the law governing cooperatives.

Although resuscitated, cooperatives remained dormant until 2000 when the Ministry of Trade and Industry (MTI) recognised their role in supporting its policies. The cooperative concept supported two important polices, the Small and Medium Enterprise (SME) policy and the Export Driven Recovery and Growth (EDRG) strategy (CSU, 2008). Primary cooperatives, in particular, were recognised as small to medium businesses and were anticipated to grow the local industries. In relation to the EDRG strategy, associations and federations of cooperatives were expected drive increases in exports of primary produce (CSU, 2008).

The cooperative movement was revived through government funding and establishment of the CSU office within the MTI (Mugambwa, 2005). CSU's primary task was to administer the registration of cooperatives. This also involved other supporting activities essential to

development and growth of the cooperatives, including the provision of subsidised capital, extension, training and audit services (Mugambwa, 2005; CSU, 2008). To legitimise the CSU, the Cooperative Society Regulation was introduced in 2003. Its purpose was to provide clear directions for the CSU and registered cooperatives to operate under (Mugambwa, 2005). Little is known about recent cooperatives' performance in PNG. CSU Records (Table 1) show that there are around 6,100 primary cooperatives registered with a total of 213,000 members and share capital totalling US$ 6.9 million (CSU, 2016). Unfortunately, there is no record to indicate whether these cooperatives are financially sound or even operational.

Table 1. Summary of registered number of cooperatives in each region of PNG in 2016

Province by Region	Number of Cooperatives	Number of Members	Total Value of Shares (US$)[1]
Highland Region			
Eastern Highlands	406	17,063	403,583
Enga	169	5,417	107,224
Hela	165	4,987	130,079
Jiwaka	93	4,499	132,879
Simbu	84	4,841	187,190
Southern Highlands	1,484	31,837	1,219,797
Western Highlands	182	8,240	308,007
Momase Region			
East Sepik	805	32,444	590,371
Madang	249	9,852	531,058
Morobe	398	15,065	1,108,176
Sandaun	192	8,875	224,731
Islands Region			
East New Britain	280	10,814	314,553
West New Britain	235	15,958	371,048
New Ireland	78	3,599	87,656
Bougainville	95	5,144	177,409
Southern Region	532		268,687
Gulf	115	2,515	51,104
Western	31	2,586	101,701
Milne Bay	128	4,976	126,889
Oro	132	8,312	238,330
National Capital District	248	5,580	193,050
Total	**6,101**	**213,022**	**6,872,542**

Notes: 1. 1 US$=3.3 PGK in April, 2017.
Source: Adapted from records supplied by the Cooperative Society Unit (CSU, 2016).

1.3. Purpose and justification of the thesis

Given small farmers' contribution to the agricultural sector of PNG and their need to access high value, niche and domestic markets, this research expects to put forward recommendations to inform the legislation and proposed policy on cooperative models that support value adding performance. The findings of the study are expected to benefit policy makers, donor agencies that promote the cooperative model, boards of directors and senior management of the agricultural cooperatives, and cooperative members.

1.4. Outline of the thesis

There are six parts to this thesis. Chapter 1 highlights the importance of the study and provides background on the first cooperative movement in PNG. Chapter 2 reviews relevant literature, to explain the institutional problems that constrain traditional agricultural cooperatives, provides insights into the hybrid models in developed countries, and highlights the restrictions put in place by the legislation and policy of PNG. It concludes with the research questions. Chapter 3 justifies the choice of research strategy. It also explains the sampling, data collection and analysis techniques used in the study. Chapter 4 provides descriptions of each case studied. It provides a brief history of each cooperative and describes their business objectives, core business activities, institutional and governance arrangements, and value-adding endeavours. Chapter 5 draws on the case studies described in Chapter 4 to test propositions underpinning the theoretical model developed in Chapter 2, and discusses the findings. The thesis concludes in Chapter 6 by answering the research questions and making practical recommendations aimed at improving the performance of agricultural marketing cooperatives in PNG, for policy-makers, directors, managers, patrons and shareholders.

Chapter 2
Literature review

2.1. Introduction

This section describes the potential role of agricultural marketing cooperatives in developing countries, and contrasts this role with concerns about investor-unfriendly institutional and governance arrangements that often characterise cooperatives in these countries. The section ends with a review of hybrid cooperative models that have emerged in many developed countries, and which offer policy lessons for developing countries.

2.2. Role of agricultural marketing cooperatives in developing countries

Two issues make it challenging for farmers in developing countries to access input and output markets. They are the characteristics of farmers and market imperfections (Murry-Prior, Sengere & Batt 2009). Farmers operate on a small-scale, and they are often illiterate and poor in terms of cash, wealth, political and social status. Access to markets is constrained by inadequate physical infrastructure and unreliable public services and utilities that increase private transport and information costs, and raise *ex ante* transaction costs associated with the search for suitable trading partners. Inadequate legal infrastructure adds to *ex post* transaction costs as the risk of losses increases when transacting parties do not have access to an affordable and reliable legal system to enforce contracts (De Janvry, Fafchamps, & Sadoulet, 1991). Pooling and marketing produce collectively via a cooperative allows small farmers to reduce high unit transaction, information, compliance, storage, transport and marketing costs (Markelova et al., 2009).

Cooperatives can also coordinate input purchases and secure bulk discounts. Timely access to quality inputs is often prioritised by small farmers (Abebe, Melaku, Tegegne, A., & Tegegne, F., 2013; Murry-Prior et al., 2009). Cooperatives can also coordinate famers' planting and harvesting schedules to better meet the needs of buyers looking for consistency in supply and quality (Biénabe & Sautier, 2005; King 1992). Small farmers experience substantial variability in yield and quality that make it difficult for them, acting individually, to fulfil contractual obligations with buyers. This risk can be reduced by pooling

produce. Cooperatives also provide a relatively inexpensive means of monitoring and enforcing quality standards. This is particularly important when accessing high value markets (Narrod et al., 2009). Farmers have more information about their peers than do external auditors, and are best able to screen members and monitor their compliance with food safety and quality standards (Narrod et al., 2008). Coffee cooperatives in PNG have a history of monitoring member compliance with production methods and quality standards required for organic certification (Murry-Prior, 2007).

High value and niche markets usually require significant capital investments to finance third-party certification schemes, cold storage, and specialised transportation (Narrod et al., 2008; Lyne & Martin, 2009). Given appropriate institutional arrangements, cooperatives can encourage small farmers to pool their financial resources and finance these indivisible, value-adding assets (Valentinov, 2007; Alene et al., 2008; Markelova et al., 2009). Cost and equity sharing partnerships with private firms are also possible with appropriately structured cooperatives (Chaddad & Cook, 2004; Lyne & Collins, 2008; Narrod et al., 2008; van Bekkum & Bijman, 2006). Equity capital and contractual commitments made by reputable trading partners often give cooperatives access to additional debt and grant finance.

Cooperatives can also play an important role in strengthening small farmer bargaining power as they control much larger quantities of produce than do individual farmers, and can meet buyer requirements with greater predictability. Consequently, they are in a better position to influence terms and conditions of contracts, and can protect their members from unscrupulous trade practices (Birthal & Joshi, 2007).

2.3. Key principles of cooperatives

Agricultural marketing cooperatives represent an extreme form of horizontal coordination in which producers (farmers) surrender decision-making power over marketing decisions in exchange for benefit and voting rights (Lyne & Martin, 2009). A similar situation would arise in a producer-owned company. The centralisation of management decisions distinguishes

these producer organisations from less formal group arrangements where management decisions are taken collectively.

A producer-owned company is an example of an investor-owned firm (IOF). There are two key differences between a traditional cooperative and a producer-owned company. Although producers own both organisations, their voting and benefit rights differ. In the traditional cooperative, members have equal voting power and are rewarded for their patronage. In the producer-owned company, as in any IOF, voting and benefit rights are proportional to investment.

The Rochdale Society of Equitable Pioneers (Hoyt, 1996; Fairbain, 2004) founded the principles of modern day cooperatives. These principles are voluntary and open membership, democratic member control and member economic participation (Hoyt, 1996). Open membership has been widely interpreted by legislators as not discriminating based on gender, religion or political belief. It has also been interpreted as not discriminating against future members by charging more to join even if the cooperative has succeeded in growing its equity capital (Sykuta & Cook, 2001; Cook & Iliopoulos, 2000; Royer, 1999). For this reason, a traditional cooperative must redeem a member's shares at their par value when the member exits the cooperative. Consequently, shares held by members of a traditional cooperative are not tradable or appreciable.

Democratic member control implies that each member has one voting right. Member economic participation has generally been interpreted as restricting membership to patrons only. These key principles remain the foundation of traditional cooperatives. They are articulated by the International Cooperative Alliance (ICA) which defines a cooperative as "an independent association of persons who are united voluntarily to meet their economic and social and cultural needs and aspirations through mutually owned and democratically controlled enterprise" (ICA, 2016).

It is often claimed that cooperatives enjoy a transaction cost advantage over producer-owned companies because the interests of their members as patrons (suppliers) are perfectly aligned with their interests as owners. This alignment of interests eliminates

information asymmetries and reduces the cost of monitoring and enforcing supply contracts in cooperatives (Sykuta & Cook, 2001). The situation is different in a producer-owned company where producers with relatively large investments will seek high returns on their capital, while those who are relatively large patrons will seek favourable prices for the products and inputs they trade with the company. However, the apparent advantage of the cooperative breaks down in circumstances where member investment is not proportional to member patronage (van Bekkum & Bijman, 2006) – which is indeed the case in a traditional cooperative.

2.4. Institutional problems of traditional cooperatives

Proponents of New Institutional Economics (NIE) theory argue that the principles underpinning traditional cooperatives result in ill-defined property rights (i.e. voting and benefit rights) that discourage member investment and starve the cooperative of capital (Cook, 1995; Cook & Iliopoulos 1999; Royer 1999). A member becomes an owner of the cooperative once shares are bought. In a traditional cooperative, a member's benefit rights are not proportional to his or her investment in shares. This results in 'free-rider', 'horizon' and 'portfolio' problems. It also aggravates the 'control' problem. Voting rights are also not proportional to investment. This can lead to an 'influence' problem.

An internal free-rider problem exists when there is unfairness in the distribution of benefit rights (Cook 1995). In the case of traditional cooperatives, where members are rewarded for their patronage and not for their investment, large patrons with small investment free ride on investments made by smaller patrons. An external free-rider problem will also arise if the cooperative offers its services to non-members at the same price paid to (or by) members (Royer, 1999).

The horizon problem arises in a traditional cooperative because members cannot realise capital gains on their equity shares (Harris, Stefanson, & Fulton, 1996; Sykuta & Cook, 2001). If they leave the cooperative, their shares are redeemed at par value. This problem is more severe when significant investment is required for value-adding assets (including intangible assets like brands) that have productive lives exceeding the expected horizon of members

(Cook & Iliopoulos, 2000; Salazar & Galve Górriz, 2011). The horizon problem also shifts members' preferences away from retaining earnings in the cooperative (to finance value-adding assets) towards current benefits such as more favourable prices for outputs and inputs (Nilsson, 2001). The horizon problem is particularly damaging in traditional marketing cooperatives as it not only constrains their investment but also constrains their ability to build relationships with buyers; preferences for short-term benefits discourage members from complying with fixed price agreements when market prices rise.

The portfolio problem is also related to the illiquid nature of property rights caused by the absence of tradable shares. Members, once invested, are unable to diversify their individual portfolios to reflect their own risk preferences (Ortmann & King, 2007). The consequence is sub-optimum investments by members.

The control problem has its genesis in principal-agent theory (Ortmann & King, 2007) and refers to the difficult task of monitoring the performance of management and aligning their incentives with those of the owners. Although this problem is not unique to traditional cooperatives, it is intensified by the lack of a market-driven share price to signal changes in the expected value of the cooperative, and members' inability to sanction (reward) managers by disinvesting (granting them shares) (Sykuta & Cook, 2001). Shares are restricted to member patrons only.

Whereas the free-rider, horizon, portfolio and control problems are attributed to ill-defined benefit rights, the influence problem arises as a result of ill-defined voting rights (Cook, 1995). Democratic voting rights in traditional cooperatives shift the power to influence investment decisions away from majority investors to majority members who may be risk averse and opposed to asset specific investments. Influence problems often arise in marketing cooperatives when divergent interests are created through the purchase of multiple products from cooperative members (Cook, 1995), and when members and non-members are allowed to participate in management decisions (Rosairo, Lyne, Martin, & Moore, 2012). Influence problems discourage member investment and also discourage prospective lenders and buyers from dealing with cooperatives (Lerman & Parliament, 1993; Hendrikse & Veerman, 2001).

Together, these institutional problems limit a traditional cooperative's ability to raise equity capital, and therefore limit its ability to access debt capital as lenders require acceptable leverage (debt to equity) ratios in order to reduce their exposure to loan default. NIE theory offers a plausible explanation for recent legislative changes in the USA, Canada, Australia, New Zealand and many European countries (Lyne & Collins, 2008) allowing them to relax the cooperative principles and to adopt hybrid cooperative models that resolve or alleviate the institutional problems associated with the traditional cooperative model. In particular, these changes have allowed cooperatives to introduce a class of shares that is non-redeemable, tradable and appreciable while restricting majority of the voting rights to patrons (Chaddad & Cook, 2004; van Bekkum & Bijman, 2006, Woodford, 2008).

Several empirical studies of marketing cooperatives in developed countries have found evidence of the NIE's predicted relationships between institutional arrangements and levels of investment (Cook & Ilopoulos, 2000; Beverland, 2007; Salazar & Galve Górriz, 2011). However, these cooperatives are patronised by relatively wealthy farmers. The situation is quite different in developing countries where farmers are poor. In these circumstances, it is appropriate to ask whether or not institutional problems are relevant to cooperative success as small farmers do not have much capital to contribute even if the incentive to invest is strong. Indeed, small farmer marketing cooperatives invariably source the bulk of their initial equity capital from donors or government agencies, and access to grant funding is often quoted as the main reason for registering a cooperative (Chirwa et al., 2005). Garnevska, Joseph, and Kingi (2014) present evidence of this in PNG. In addition, capital requirements are usually modest as these cooperatives often deal with commodities that require little value adding other than drying, grading, storage and transport. Consequently, it seems unlikely that institutional problems would show up as binding constraints.

Nevertheless, evidence from recent empirical studies of producer marketing organisations in developing countries is consistent with the NIE predictions (Chibanda, Ortmann, & Lyne, 2009; Nganwa, Lyne, & Ferrer, 2010; Rosairo et al., 2012, Esnard, 2016). Over time, organisations burdened with the horizon problem struggled to repair, maintain and extend grant-financed assets, as they were unable to retain profits owing to member preferences for short-term price advantages in the absence of capital gains. This raises important

questions about prevailing cooperative legislation and knowledge of hybrid cooperative models within the agencies that facilitate the establishment of cooperatives. No empirical work has been conducted in PNG to identify *de facto* institutional arrangements within producer cooperatives, their impact on investment in value-adding assets, or their consistency with current cooperative law and proposed cooperative policy.

2.5. Governance arrangements

The Committee of Inquiry commissioned to report on PNG's cooperatives in 1971 identified both inadequate capital and poor management as primary contributors to their failure. The previous section argued that ongoing capital constraints are often a symptom of the horizon problem that arises due to ill-defined benefit rights. Similarly, poor management is often a symptom of weak governance arrangements (Rosairo et al., 2012).

Governance is defined as the decision-making processes and its capacity to implement its decisions (Landell-Mills & Serageldin, 1992 as cited in Chibanda et al., 2009). The governance system of cooperatives is made up of members, their board of directors (BoD) and management (Cornforth, 2004). The members are an important part of the governance system by virtue of their democratic voting rights (Cornforth, 2004). They hold the cooperative's directors accountable for their policy decisions by voting them on or off the board at annual general meetings (AGMs). The BoD represents the interests of the cooperative's members and is responsible for the cooperative's strategic direction. Senior managers appointed by the directors are responsible for the operational planning and implementation of the board's business strategy. They report to the board, and are ultimately held accountable by the board's power to remove them from office.

Good governance is defined by three elements. These elements are accountability, transparency, and participation (Nanda, 2006). Accountability is ultimately assured by well-defined voting rights and sound electoral procedures, and by the board's ability to hire and fire managers (Rosairo et al., 2012). Transparency is achieved through sincere disclosure of financial statements, circulation of resolutions taken at meetings, and review of budgets and audits (Nanda, 2006). Participation emphasises consultation with members, but not

their direct involvement in decision-making. This separation of ownership and control can alleviate influence problems even where voting rights are democratic rather than proportional to member investment (Rosairo et al., 2012). Management problems are likely to arise where these features of good governance are absent or lacking. In cooperatives, management problems are often exacerbated by their patron control feature as small farmers often lack the off-farm knowledge and skills required to perform well as directors (Cook, 1994), or even to appoint competent and experienced managers (Adrian & Green, 2001*).*

Flawed electoral procedures such as voting by show of hands instead of secret ballot tend to favour influential or popular nominees, rather than those with integrity and business acumen. Empirical studies of producer organisations in developing countries report evidence of positive relationships between good governance arrangements and performance. Chibanda, et al. (2010) found positive correlation between voting by show of hands and low levels of education amongst directors, and a negative correlation between these variables and returns to members. Rosairo, et al. (2012) attribute the failure of producer-owned companies in Sri Lanka primarily to the appointment of government officials as directors. These directors were not nominated or elected by members, nor could they be removed by the board - yet they were mandated to influence board and management decisions. Similarly, Esnard's (2016) study in St Lucia found that cooperative performance suffered when externally appointed directors outnumbered those nominated and elected by members.

PNG's rural communities are governed by a mix of official and customary rules, and there is evidence of customs influencing governance arrangements in producer organisations. Lyne (2012) describes the role of the 'haus boi' in a West New Britain cocoa cooperative. The 'haus boi' is a culturally recognised, male-dominated, decision-making authority. Under this system of governance, members have no voting rights at all. The influence of customary institutions on the performance of PNG's cooperatives has not been examined. However, a recent study by Garnevska et al., (2014) in the Manus province revealed that only one of four cooperatives studied had a board of directors. Management was assigned to a

committee but it was not clear how, or even if, members were nominated and elected. The authors reported serious conflicts in one of these cases.

Other governance issues considered by Chibanda et al. (2009) and Rosairo et al. (2012) include the regularity of financial audits and annual general meetings (AGMs), adherence to notice periods and quorum requirements, circulation of audit reports and minutes of meetings, and training for managers and office bearers. There is clearly a need to establish the nature of governance arrangements in PNG's cooperatives, and how they relate to legal requirements and cooperative's strategy.

2.6. Hybrid cooperatives and business strategy

Increasing demands for safe, high quality and differentiated food products have not only highlighted the inability of traditional marketing cooperatives to finance value-adding assets and to build long-term relationships with buyers, but also resulted in new cooperative models that alleviate the institutional problems of traditional cooperatives. Chaddad and Cook (2004) define a number of hybrid cooperative models that adopt, to varying degrees, the institutional arrangements of investor-owned firms. One of the most well know hybrids is the New Generation Cooperative (NGC), which was credited with the revival of the USA's Midwest in the 1990s (Cook & Iliopoulos, 1999; Harris, Stefanson, & Fulton, 1996). In developed countries, the emergence of these hybrid models was often facilitated by changes made to cooperative legislation. New Zealand took the lead in this regard introducing a single Act for cooperatives and companies in 1996 (Lyne & Collins, 2008).
The variant closest to the traditional cooperative model is the proportional investment cooperative or PIC. The PIC obliges members to invest in proportion to their patronage (Royer, 1999). This generates equity capital and aligns the interests of members as investors and patrons, reducing transaction costs in supply contracts. However, the horizon problem remains and discourages members from voluntarily investing more than the minimum amount required to sustain their patronage. In circumstances where members are poor, the PIC offers little advantage over a traditional cooperative and is best suited to a business strategy focussed simply on coordinating production and negotiating better terms for its members in market transactions.

Members would be more willing to invest and retain profits in their cooperative if they could realise capital gains on their investment. In this case, there would also be less incentive to behave opportunistically when market prices offer short-term gains over prices agreed with trading partners. Member-investor cooperatives or MICs seek to alleviate the horizon problem by rewarding members for their investment. This is often achieved by adjusting the nominal price of members' redeemable shares to reflect changes in the MIC's equity capital, or by awarding bonus shares (Chaddad & Cook, 2004). While such institutional innovations are seldom prevented by cooperative legislation, they do not fully address the horizon problem, as they do not generate market-related capital gains. Moreover, the gains are likely to be conservative as these methods of rewarding investors expose the cooperative to increased redemption risk (Lyne & Collins, 2008). MIC's also sacrifice the PIC's advantage of low transaction costs as investment is not proportional to patronage.

PNG's Cooperative Societies Act 1982 (CSA, 1982) does provide for the issue of bonus shares (Section 95(b)), but shares are redeemed at the lesser of their nominal or net asset value (Section 62). In essence, this legislation prevents members from realising capital gains on redeemable shares, and therefore precludes MICs. It also precludes PICs as shares may be redeemed only on liquidation of the cooperative (Section 58) or when a member dies (Section 62).

In New Zealand, cooperatives are permitted to introduce a second class of shares that are non-redeemable, tradable and appreciable. This addresses the horizon and portfolio problems as investors can realise capital gains by selling these 'B-class' shares at market prices. Ownership of B-class shares is not necessarily restricted to members of the cooperative. Investor-share cooperatives (ISCs) often sell B-class shares to strategic partners, and some ISCs list these shares on a stock exchange to be purchased by members of the public. However, these shares carry no, or limited, voting rights to prevent control shifting from patrons to external investors. In New Zealand, external investors may not exercise more than 40% of a cooperative's voting rights even if they are majority investors (Woodford 2008).

ISCs have the potential to add significant value to patrons' products as they create incentives for investment and can offer shares to both patrons and non-patrons. They can also establish equity-sharing joint ventures with trading partners to overcome hold-up problems that would otherwise discourage investment in value-adding assets that are transaction specific (Williamson, 1985, pp. 85-102). These benefits do, however, come at the expense of higher transaction costs in supply contracts owing to the misalignment of patron and investor interests. In developing countries, small farmers looking to access high value markets by differentiating their product would no doubt view this as a small price to pay for the opportunity of establishing equity-sharing partnerships with processors and exporters that provide capital, expertise and intangible assets like brands, reputation, and contracts with downstream buyers. Unfortunately, PNG's Cooperative Societies Act 1982 makes no provision for the issue of non-redeemable shares and therefore precludes ISCs.

One way of overcoming legal constraints that prevent cooperatives from developing equity-sharing joint ventures with strategic partners is to establish a subsidiary company co-owned by the cooperative and the strategic partner. Value-adding assets are financed and owned by the subsidiary company. However, this 'solution', often referred to as the 'Irish Model' (Chaddad & Cook, 2004), does not address institutional problems within the parent cooperative. This makes it difficult for the cooperative to match the equity capital invested by its strategic partner over time, and control of the subsidiary company inevitably transfers to the partner leaving producers no better off. Lyne and Collins (2008) argue that a unitised trust would better serve as a warehouse for members' interests in a subsidiary company as tradable participatory units assigning benefit and voting rights proportional to individual investments in the trust could be matched directly to shares acquired by the trust in the subsidiary.

Another pathway to a value-adding business strategy, in particular a 'focus strategy' where the cooperative aims to exploit small niche markets (Porter, 1985; Nilsson & Ohlsson, 2007), is to establish a New Generation Cooperative. NGCs raise capital by selling tradeable delivery rights to patrons. In effect, these rights represent a second class of shares that are non-redeemable and appreciable as they can be traded by patrons at market value. This not

only resolves the horizon problem, but also aligns the interests of members as patrons and investors. These outcomes create strong incentives for patrons to honour their supply commitments. NGCs that purchase a single product from their patrons have proved very successful at adding value and building enduring relationships with buyers. In some cases, existing cooperatives, like the Tatua dairy cooperative in New Zealand, have issued tradable delivery rights free of charge to patrons simply to gain more control over supply and safeguard their niche markets (Nilsson & Ohlsson, 2007).

Although PNG's Cooperative Societies Act 1982 does not provide for the issue of non-redeemable shares, it is possible that legislators may condone the sale of non-redeemable, tradable and appreciable delivery rights, especially if they improve the performance of cooperatives. While it would be optimistic to think that cooperatives patronised by small farmers could raise significant amounts of capital by selling tradable delivery rights, NGCs create strong incentives for investment and compliance, and could be good candidates for grant funding where equity-sharing arrangements with strategic partners are unlikely or impossible. Whether or not PNG's proposed cooperative policy and legislation will embrace the NGC and other hybrid structures needed to support business strategies that involve more than just coordinating production and negotiating favourable terms for commodities for undifferentiated products is a question that this research will endeavour to answer.

2.7. Research objectives and questions

The purpose of this study is to analyse the impact of PNG's cooperative legislation on the ability of agricultural marketing cooperatives to achieve their intended business strategies. In relation to this purpose, the objectives of this study are to;

1. Examine the institutional and governance arrangements of producer organisations in PNG and assess how these arrangements affect value adding goals and performance of these organisations.
2. Investigate the consistency of the institutional and governance arrangement of existing producer organisations with the cooperative legislation and policy of PNG.
3. Recommend improvements to legislation and policy by drawing on theory, lessons from other countries, and case studies of producer organisations within PNG.

There are five research questions that will guide this study and ensure the objectives stated above are achieved. These questions are derived from the literature in Sections 3.3-3.5. These questions can be stated more explicitly as follows:

1. Do producer organisations apply different institutional and governance arrangements to support business strategies that require different levels of value-adding?
2. Are the institutional and governance arrangements applied by producer organisations affecting the achievement of their intended business strategies?
3. How consistent are these institutional and governance arrangements with PNG's existing cooperative law?
4. Would changes to PNG's cooperative policy and legislation make it easier for cooperatives to achieve their intended business strategies?
5. What other factors contribute to the achievement of intended business strategies?

Two case studies were used to address the research questions. The first case was a producer organisation that adds little value to products destined for commodity markets by providing primary processing and transport services. The second case was an organisation that also deals with commodity markets but provides a higher level of processing of products.

Chapter 3

Research methods

3.1. Introduction

This section describes the methods used to collect and analyse data. Section 3.2 outlines a conceptual model that underpins these methods. Section 3.3 justifies the use of the case study research strategy and details how the cases were selected. Section 3.4 describes how data collection was done and the final section explains how data was analysed.

3.2. Conceptual model

The conceptual model illustrated in Figure 1 summarises the propositions discussed in Section 2. Flexibility (or weak enforcement) of cooperative law permits variation in the institutional and governance arrangements of cooperatives. This flexibility allows cooperatives to adopt hybrid structures that create incentives to invest, retain earnings and comply with the terms of downstream contracts. The institutional and governance arrangements that define business structure are expected to impact on the achievement of planned business strategies, along with other (external) factors.

This research investigated the hypothesis that producer organisations with weak institutional and governance arrangements were unlikely to achieve their value-adding goals. In particular, it set out to test the following propositions:

a) Producer organisations that issue a class of non-redeemable, tradable and appreciable shares or delivery rights are more likely to sustain value-adding goals.

b) Producer organisations that issue only redeemable shares are unlikely to sustain value-adding goals if they do not revalue these shares or issue bonus shares.

c) Producer organisations are more likely to sustain relationships with downstream buyers if they issue tradable delivery rights or otherwise allow members to realise capital gains proportional to both investment and patronage.

d) Producer organisations that separate ownership from control by centralising decision making in the hands of competent directors and managers are more likely to achieve their value-adding goals.

e) Producer organisations are more likely to sustain value-adding goals if members nominate elected directors, if elected directors outnumber other directors, if voting is by secret ballot, if directors have the authority to hire and fire executive managers, and if the organisation specialises in a single product.

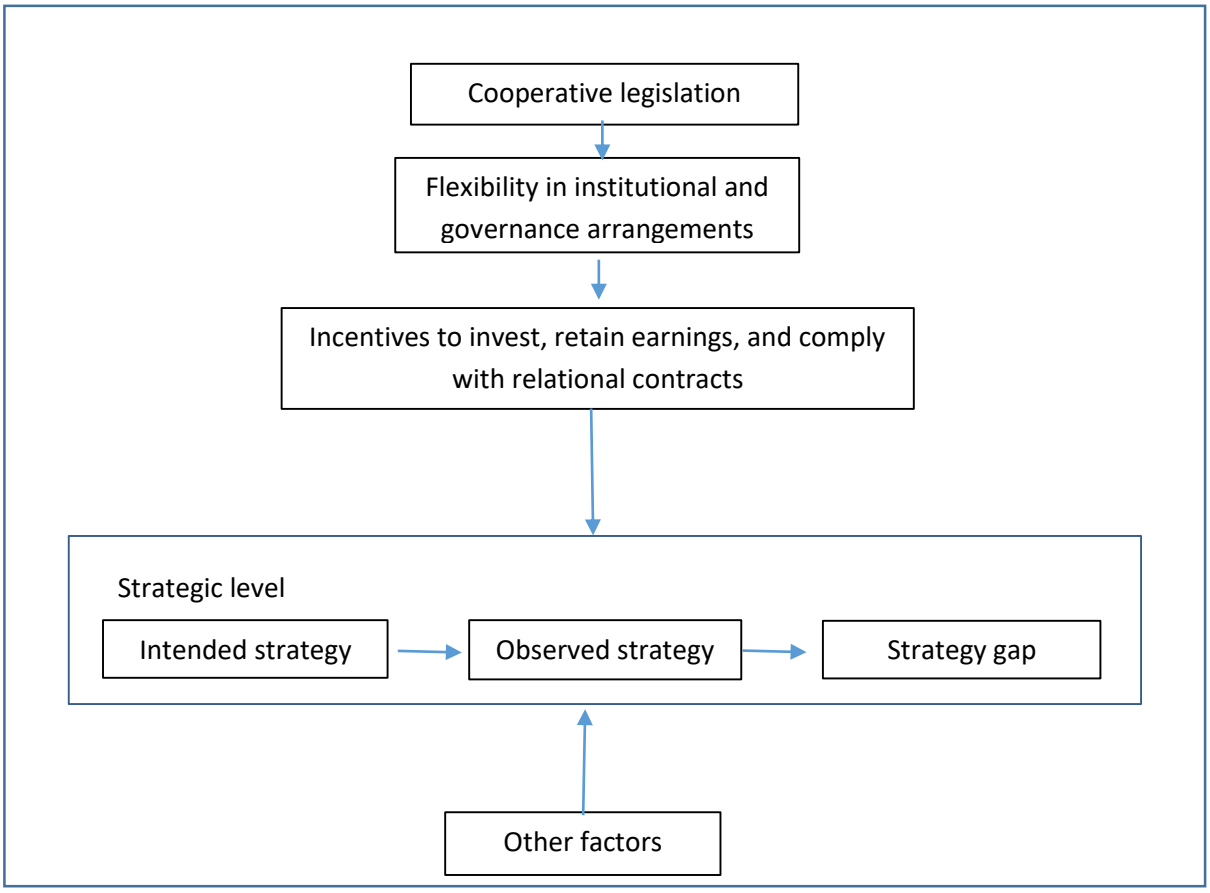

Figure 1. Conceptual model illustrating the impact of a cooperative's institutional and governance arrangements on the achievement of its intended strategy

3.3. Research strategy

This study draws on the strength of qualitative research that is it enables a phenomenon to be studied in a holistic manner and in its natural setting (Jacob, 1988; Guba & Lincoln, 1994). Moreover, it provides a rich in depth understanding of the complex relationships that shape the phenomenon (Miles & Huberman, 1994). In this instance, the research questions deals with the relationship between value adding strategies of producer organisation and its institutional and governance arrangements. Specifically, how the institutional and governance arrangements are tailored to support the intended strategy of the organisation.

A case study method was chosen for this study over other qualitative methods. The case study method is a recognised research approach in the growing field of organisational research, particularly to study organisational behaviour and processes (Hartley, 2004). This study draws on the strength of qualitative research that is its ability to produce a wealth of detailed data from entities that have small populations (Bergman, 2008 pp 12-14: Patton, 1990 pp 165). Meyer (2001) argues that the case study method is open to use in theory and conceptual categories that guide the research and the analysis. The case study method is unlike other qualitative methods such as grounded and ethnography theoretical perspective, where the theory emerges from data collected. This study was guided by the NIE theory detailed in the literature review and propositions stated in Section 3.2. Moreover, this methodology provides a richness of data as it is collected from multiple sources. Yin (2009, p.8-15) recommends the case study methodology when a particular study focuses on contemporary events over which the researcher has little or no control, and seeks answers for 'how' and 'why' questions. It suggests that this approach is suited for explanatory enquiries. The research carried out seeks to provide explanations for the performance of producer organisations based on their institutional and governance arrangements and other factors as well.

3.4. Case study design

Case study methods have no specific requirements guiding research design, unlike other qualitative and quantitative research methods (Meyer, 2001). Although Yin (1989: 2009) and Eisenhart (1989) provide useful insights into the strategy, they leave the design decisions to

the researcher. These design choices involve identifying the unit of analysis, selection of cases, the number of cases, and selection and choice of data collection procedures.

For this research the units of analysis were identified as 'producer organisations'. Yin (2009 p. 29-32) recommends that a case be correctly identified by accurately specifying the research question. Vague research questions increase the chance of identifying incorrect units of analysis. Based on the first research question, which seeks to explain variation in value-adding performance by examining variation in institutional arrangements, the unit of analysis was not limited only to cooperatives but covered all agricultural marketing organisations owned and patronised by small-scale farmers.

In terms of selection criteria of cases, the cases in this study were purposefully selected to ensure variation in their institutional and governance 'explanatory' variables and to control for other factors likely to influence performance. To this end, efforts were made to select organisations within the same geographical location, purchasing agricultural commodities that are mostly exported, and benefiting from similar levels of external support. Within this subset of candidate organisations, the final selection was based on the organisation's accessibility and its willingness and ability to provide rich information. Preference was given to organisations that had been operating for more than three years.

Deciding on the number of cases and sampling strategy are fundamental to increasing the reliability and validity of the data collected (Yin,). Case studies are often criticised for their limitations in generalising findings to the population studied. Eisenhardt (1989) and Hartley (2004) argue that the sampling logic for case studies generate information that is extrapolated to theory and not to the population studied. Eisenhardt (1989) suggests that cases selected should be purposely selected to replicate or extend the theory studied or to fill in theoretical categories and provide polar examples.

This study used multiple case studies instead of a single case study. Hartley (2004) recommends a single case study as an option where access difficulties, resources or the rarity of the phenomenon precludes a wider study. In contrast, selection of multiples cases can facilitate a comparative analysis. For this study two cases were purposely selected based on the criteria mentioned earlier. These two cases represented polar cases in the phenomena under investigation.

3.5. Data collection method

An advantage of using the case study is the multiple sources of data. Case studies typically combine collection methods such as archives, interviews, questionnaires and observations (Yin, 2009 pp 101-124). The choice of data collection in this study was constrained by time, financial resources and access. Three data collection methods chosen were interviews, archives and observations.

For the interviews, a semi-structured interview was employed to allow respondents to talk freely and share their knowledge and experiences without pre-existing expectations from the researcher. This enabled probing of responses which may not be possible to do in a highly structured questionnaire (Patton, 1990). In this study, an interview schedule was used to guide the interview (Appendix 3). The interview schedule was based on the propositions and conceptual model presented in Section 3.2. A snowballing method was used to select respondents. This enabled the researcher to purposefully select respondents who could provide insights and useful information. The respondents included; directors, managers, shareholders, stakeholders from the Department of Agriculture and Livestock and relevant industry boards. The number of respondents in each producer organisation and stakeholder was determined by the ability to achieve saturation of the information. Interviews were audio recorded to ensure accuracy in the data collection process. These recordings were later transcribed to facilitate data analysis.

In addition to the interviews, documents were collected and observations made. The collection of documents included founding constitutions, annual reports, audited financial statements, unpublished reports, records, memo and letters. These documents provided useful information about issues not captured in the interviews. Observations were made whilst visiting the processing facilities. These observations were recorded as notes and photographs.

Participants' confidentiality and consent was given priority for ethical reasons. Prior to interview, respondents were informed of the purpose of study and asked to sign a consent

form (Appendix 2) in order to participate. Interviews were recorded once permission was received from respondent. All data were kept by the researcher at a secure location.

An important practical issue in the fieldwork was the selection of cases. To select suitable cases required knowledge on the population of functional producer organisations. Prior to fieldwork a list of producer organisations was drafted up based on personal contacts, CSU records and internet searches. Some of these organisations were short-listed and prioritised using the selection criteria mentioned earlier. In each case, the chairperson was contacted and invited to participate in the study. Final selection was based on willingness to participate, ability to provide rich information, and physical accessibility. The consent form (Appendix 2) and a research information sheet (Appendix 1) were then sent to the respective chairs ahead of the field visits.

3.6. Data analysis

Data was analysed based on '“pattern matching and explanation building” as recommended by Yin (2009, pp. 136-143). Trochim (1989) describes a pattern as an arrangement of object and entities and defines pattern matching as process of linking two patterns, theoretical patterns and observed patterns from empirical data. In this study, the NIE theory expressed as propositions (listed in section 3.2) were matched with patterns observed from the two cases. Pattern matching involves pattern identification within each case and then across cases. Eisenhardt (1989) points out that within case analysis requires descriptive write-up of each case, the purpose is to generate insights and be familiar with each case. This process allows patterns in each case to emerge. While, cross case analysis can be done in a variety of ways. The first method is based on categories or dimensions as basis for comparison. These categories are derived from theory and propositions under investigation. The second is the pairing method, two cases are selected at one time and the similarities and difference between each is pointed out. The third method is based on data sources. Patterns in each data source is compared against each other on a case by case basis. This builds the validity of the data.

In terms of explanation building, the aim is to analyse data by building an explanation about the cases. According to Yin (2009, pp. 136-143) this involves building a set of casual links

about how and why a something happened. This is applicable where data does not support the propositions. The inconsistency can be explained through the building of an alternative theory.

In this study, the identification of patterns within case study was derived from data transcribed from interview combined with data from archives and observations for each case. This is presented as case description write-ups in chapter 4. The case description write-ups encompasses the key features of the industry and establishment, objectives, core activities and the institutional and governance attributes of each case.

After analysing the patterns within each case, comparisons were made across the cases and the results were used to test the validity of the propositions (listed in Section 3.2). This was done by identifying dimensions for comparison, this study used institutional and governance attributes. Attributes of traditional cooperatives based on the NIE theory was compared with data from each case. The result of the pattern matching exercise was presented in tabular form (table 2 in section 5.2).

Chapter 4

Case descriptions

4.1. Introduction

This chapter presents descriptions of the two producer organisations engaged in this study. It begins with a brief on the selection of cases. It goes on to describe each case, firstly by providing a background of their respective industries, then investigates their business objectives, core business activities, institutional and governance arrangements, and value-adding activities. A summary of each case is provided as a way to conclude each case description.

4.2. Selection of cases

Fieldwork was conducted from the end of November 2016 to February 2017. This began with a selection process of producer organisations most suitable for the study. The researcher initially attempted to select producer organisations within a single commodity industry, which was the cocoa industry. According CSU records there was a large number of cooperatives registered with cocoa marketing cooperatives. In addition to the cooperatives, there was a producer company involved in cocoa marketing. However, after a visit to the CSU office and consultations with the stakeholders of the cocoa industry, the researcher learnt that many of these cooperatives, including the producer company, were no longer operational. From consultation with stakeholders, the researcher was able to identify and confirm participation of one cooperative which was operational, accessible and willing to participate in the study.

As a result of the non-operational status of the cooperatives in the cocoa industry, other export commodities were sought as an alternative. Producer organisations in the coffee industry provided a suitable option. A Fairtrade coffee cooperative with a subsidiary company was selected, however, upon consultation with the chairperson it was apparent the key respondents were unwilling to participate. Safety and accessibility issues hindered the researcher from selecting other producer companies and cooperatives in the coffee industry located in the highlands of PNG. Instead, a rubber company co-owned by small

rubber farmers was chosen. The researcher identified this company through an internet search and later consulted stakeholders to verify its operational status. The company's chair welcomed the invitation to participate in the study and was willing to provide a rich source of information. Also, a group of flower growers were willing to participate, however, their product would be classified as a high value crop which did not enter the export market. This did not match the criteria specified in section 3.4, therefore this organisation was ruled out.

The main difficulty experienced in the selection and confirmation of participation was communication issue. Most small farmer owned producer organisations in PNG are not connected to telephone or internet services due to their remote locations. Direct contact was not possible; the researcher was assisted by stakeholders who willingly provided personal contact details of chairpersons of the producer organisations.

For the purpose of this study, two producer organisations representing different ownership structures were chosen. These cases were selected as they satisfied the criteria described in Section 3.4. These producer organisations were coded as CASE 1 and CASE 2. CASE 1 is a cocoa cooperative owned by smallholder cocoa farmers. CASE 2 is a company co-owned by smallholder rubber farmers and a strategic partner that processes 'technically specified rubber' (TSR) from natural rubber.

4.3. CASE 1

CASE 1 is one of the many cooperatives established post-2000 following the government's decision to revive PNG's cooperative movement. It is a cooperative that produces and markets dry cocoa beans. CASE 1 operates a cocoa farm, carries out primary processing of cocoa beans and operates a buying station for dried and wet beans. It purchases cocoa beans from its members and on-sells it to a local exporter. It is a small player in the domestic cocoa industry. CASE 1 struggles to stay in business as it is unable to offer favourable prices to its members. Nevertheless, it sold 238 ton of cocoa from 2014 to 2016. This represented less than 1% of the total volume of cocoa export out of the country in the year 2016 alone.

CASE 1 is owned and governed by small cocoa farmers. There are 500 small farmers who are patron members of the Cooperative. These farmers own 1-2 hectares of cocoa farms (consisting of 1000-1500 trees of cocoa) within the vicinity of the Cooperative's setup. The farmers are mostly settlers who have bought land off the local land owners. Cocoa farming is the main source of livelihood for these farmers.

To collect the information necessary for this study, semi-structured interviews were conducted with eight respondents coded as 1A to 1H. They included three directors, three ordinary members of the Cooperative and two external stakeholders. These interviews were conducted in Pidgin, a common language in PNG. Interviews were audio recorded upon consent from the respondents. The interviews took a minimum of thirty minutes and a maximum of two hours.

4.3.1. Background on the cocoa industry

Before describing CASE 1's observed strategy and its institutional and governance arrangements, it is important to have an insight into the industry in which it operates. This will provide the context and provide a brief on the product flow and highlight the underlying industry structure that shapes the competitive environment for CASE 1.

PNG is a small player in the world cocoa industry but this industry is a key contributor to the PNG economy. PNG produces only 1% of cocoa on the world market. The cocoa industry is a key export earner in the agriculture sector of PNG. It contributed an annual average revenue of US$79 million from 37,000 ton of cocoa exported in the year 2011 to 2016 (Cocoa Board of PNG, 2017). It made up 13% of the total export revenue received from the agriculture sector from 2011 to 2016 (Bank of PNG, 2017). It trails behind palm oil, which contributes 53% of the total agriculture exports, and coffee which contributes 27%.

The product flow of cocoa in the domestic market begins at the farm gate as a cocoa pod and ends with the exporters as bagged dry beans. Figure 2 details this flow of cocoa through different players in the industry. There are five discrete processes; harvesting of pods, primary processing, collection, and bulking and exporting. At the farm level the cocoa pods

are harvested from the cocoa trees, split and the wet cocoa beans are extracted. After extraction of the beans primary processing of cocoa is done. This process involves fermentation and drying. Fermentation is a critical process that enables the chocolate flavour to develop in the beans. After five days of fermentation, the beans are dried. The drying ensures moisture levels are reduced and enable cocoa to be stored up to a maximum of 9 months. After the beans are dried, sorting and packing takes place. The defective beans are removed and then the beans are packed into jute bags, each weighing 63.5 kilogram and labelled with respective fermentary numbers for traceability purposes. Once the bags are packed then the cocoa is ready to be marketed. This involves collection of the dried cocoa bags through buying centres located throughout the 14 cocoa growing provinces in PNG. At the buying centres, the bags of cocoa are stored to ensure sufficient quantities are reached for transportation to exporters. The exporters then sell the dried cocoa beans to importers and chocolate processors overseas.

Quality inspections are done at buying centres and at the exporters' warehouse prior to export. Quality checks are done through sampling and cut tests. At the buying centres, a sample cocoa beans are drawn from each set of bags of cocoa delivered. Though visual inspection defective beans are detected. The categories of defective beans are mouldy, slaty, insect damaged, double, broken, germinated and flat beans (Cocoa regulation, 1982, Section 5). The acceptable percentage of defective beans in a sample of 100 beans should be 1% for slaty beans and 5% for all other defective features (Cocoa regulation, 1982, Section 5).

At production level, there is dominance by small farmers. There are about 150,000 small farmers who cultivate no more than five hectares of land (Curry et al, 2007). The production averages a yield of 300-500 kilogram of dry bean per hectare (Ngim, Gende, & Crozier, 2016; Curry et al, 2007). These farmers contribute 90% of the total production and the plantation sector accounts for the other 10% (Cocoa Board, 2016). The low production from plantations is attributed to an extended period of low prices, an escalation in land tenure disputes (Curry et al, 2007), and the high cost of production particularly labour costs (Omuru, 2003).

At the processing level, a number of small farmers operate fermentaries. There are 5,500 small farmers with fermentaries, this approximately 4% of total households[1] involved in cocoa farming. In addition to this, there are 2,500 cocoa bean dealers who process wet beans from farmers without fermentaries (Allen et al., 2009). Small farmers operate mini-sized fermentary units containing four sweatboxes and wood-fired kiln driers specially designed to meet their production output and financial capacity. Large entities operate fermentaries with a maximum of 20 sweatboxes and dryers powered by diesel or electricity. The cost of a fermentary and drier depends on the size and technology used in the drying process.

At the marketing level, two exporters dominate the market for dried beans. These exporters have an extensive network of cocoa buying stations throughout PNG. This is a strategy to gain economies of scale. These exporters account for 75% of the total market share for cocoa exported. The remaining 12% of the market share is distributed among 12 other exporters (Cocoa Board, 2017).

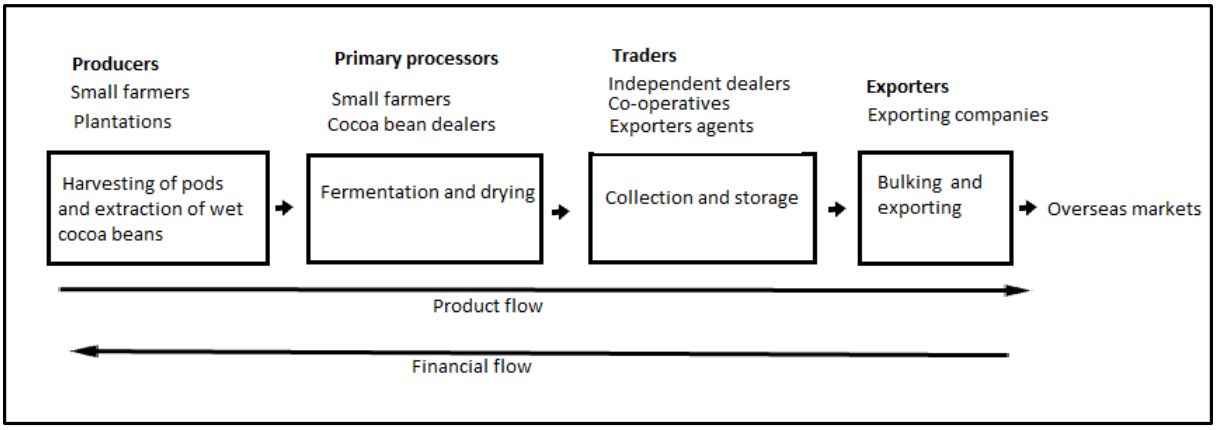

Figure 2. Product flow of dried cocoa beans in the domestic market and players involved at each stage

In terms of central state agencies, the Cocoa Board of PNG has the overarching responsibility of promoting cocoa as a sustainable industry. It regulates the industry by licensing traders in the industry, setting quality control standards and providing support for research, extension and downstream services. It also manages a cocoa stabilisation funds

[1] This is calculated based on figures from Curry et al., (2007). The population of small cocoa farmers is estimated to be 150,000.

for the producers. Cocoa and Coconut Institute (CCI) is the delegated research arm of the Board.

There are opportunities for the PNG cocoa industry to exploit the market for its fine-flavoured cocoa beans. Fine flavour cocoa is produced from genetic varieties of cocoa planting material derived from 'Criollo' and 'Trinitario' varieties, while bulk cocoa is produced from 'Forastario varieties'. Cocoa in the world market is dominated by 'bulk cocoa' produced by the Ivory Coast and Ghana. CCI, through years of research, have developed hybrid varieties of fine cocoa which has been distributed to all producers throughout PNG. PNG contributes 9% of the world's fine flavour cocoa (Royal Tropical Institute, 2013). Despite the production of fine flavour cocoa varieties, small farmers sell their cocoa as bulk cocoa at standard world market prices.

PNG's ability to capture premium price from it fine flavour cocoa varieties is limited by its ability to ensure consistency in quality and quantity of cocoa produced by numerous small farmers. Unlike commercial operations, small farmers rely on family labour and are price sensitive; production is high when the price is high and there are no incentives to produce when the price is low (Curry et al., 2007). PNG farmers are allowed to process their own cocoa to ensure maximum returns are received by farmers. This is not the case in other countries where cocoa primary processing is carried out by certified bean dealers only. The downside of this is that quality is undermined due to substandard quality control practices and lack of maintenance of processing facilities, particularly the driers.

Furthermore, the outbreak of Cocoa Pod Borer (CPB) in 2006 and its ongoing impact has reduced quantity significantly, as small farmers struggle to combat the pest. Production has estimated to have reduced by 6% every year since the outbreak of CPB (Curry et al., 2007). The small farmers are unable to combat the pest on their own due to the high cost of chemicals and tools, coupled with limited knowledge on control methods.

In response to these issues, donor and government support have been put in to assist small farmers restore their livelihood. One such donor funded project is the 'Productive Partnership in Agriculture Project (PPAP)' funded by the World Bank, IFAD and EU and

implemented by Cocoa Board. This project is worth US$ 9.3 million. It aims to improve the livelihood of small cocoa farmers through the improvement of the performance and the sustainability of the cocoa value chain (Cocoa Board, 2016).

4.3.2. Objectives and core business of CASE 1

With this background, CASE 1 is set up to capture the benefits offered by the donor and Government in response to CPB. Its objective, as stipulated in its constitution, is to process, store and market its members' produce. There was no documented business plan to provide details of how it intended to achieve this objective. Directors 1A and 1B, and members 1E and 1F, claimed that the vision of the Cooperative was to venture into export marketing, exploiting niche markets, but it had made little progress in this regard. In 1A's own words:

> *"The Cocoa Board has found a potential market in New Zealand and Australia. The Cooperative is not in a position to export yet. A large fermentary and dryer unit, with the capacity to process one tonne is needed. Samples of dried cocoa were sent but did not meet the buyers' standards."*

In regards to its objective of processing, the Cocoa Board had funded its processing facility. The Cocoa Board engaged CASE 1 to help roll out its CPB recovery programme, and equipped the Cooperative with a fermentary and dryer unit. Image 1 shows the fermentary set up. It contains four fermentary boxes built of timber sheltered under an iron roofing. Attached to the fermentary is the drier, shown in Image 2. This is a wood-fired kiln dryer with capacity to process 500 kilogram of wet cocoa beans per week. Compared to large plantation operations, CASE 1's fermentary set-up is small. On large plantations, 20 ton of wet beans per week can be processed using cascade style fermentary units and diesel-fired heated drying beds. In terms of achieving its objective of marketing, it has not yet achieved an export market status.

Its marketing service is limited to buying wet and dry cocoa beans at its central buying station, located within the vicinity of its members' farms. The wet beans bought from its members are processed into dried beans using this facility. Members who are able to

process wet beans on-farm pack their dried beans in jute bags, ensuring each bag weighs 64 kilogram. These bags are labelled with the farmer's fermentary licence number (issued by the Cocoa Board) for traceability purposes. The farmer stores them until they have sufficient quantities to deliver and sell to CASE 1. Once brought into the premises of the Cooperative, the quality inspections are done.

The reason for the establishment of a central buying station was to reduce transport costs for its members. The main issue for CASE 1's members, particularly if they operate individually, is the high transport cost. Although not too far away from the main town, it is only accessible by four-wheel drive vehicles due to rough road conditions and water crossings. This makes transport costs higher than usual.
1H claims in his own words:

"Members receive a price benefit similar to selling in town. Transport fee is exempted."

In terms of storage, it is able to provide minimal storage space for the cocoa it receives compared to large commercial operations that have specifically designed buildings. CASE 1 uses a 20-foot shipping container as its storage facility. The container is able to cater for 100-200 bags of cocoa at one time. This container and the setup of the buying station is illustrated in Image 3.

Image 1. Fermentary setup donated by the Cocoa Board

Image 2. CASE 1's kiln cocoa drier

CASE 1 owns 10 hectares of land. A large portion (90%) of this land is planted to cocoa. The total production of dry bean cocoa expected from this land is estimated to be six ton[2] per

[2] This estimation is based on the assumption by Omuru (2001) cited in Curry et al (2007) that dry bean production for a smallholder system is at 620 kilogram per hectare.

annum. The Cooperative's dryer on the other hand produces 300 kilogram of dry beans (500 kilogram of wet beans) per week. Given this yield, the dryer should be able to meet the processing capacity required by the farm if production is evenly distributed throughout the year. However, this is not the case, at peak seasons when production is expected at its maximum, the limited processing capacity of the drier becomes a major problem for the Cooperative. This also limits CASE 1's ability to process wet beans purchased from its members.

CASE 1 relies heavily on donor support to achieve its objectives. Apart from PNG Cocoa Board's donation of the fermentary unit, the Local Level Government also gifted members of CASE 1 with a vehicle to help transport its cocoa. Unfortunately, this vehicle was repossessed by a micro-finance bank to repay defaulted payments for a loan taken out on the land. At the time of the study, the Cooperative was also participating in a project funded by the World Bank, the Productive Partnership in Agriculture Project (PPAP). This project gave CASE 1's members access to training on cocoa pod borer management, tools, and to clone and hybrid CPB tolerant planting material through the establishment of nurseries and bud wood gardens. The Cooperative collaborated with a local cocoa exporter to implement this project. Formally registered as a cooperative in November of 2009, CASE 1 was able to sustain its cocoa buying station despite the damage wrought by CPB, thanks to technical, financial and market support provided by the government, donors and a local cocoa exporter.

To sum up CASE 1's ability to meet its objectives is dependent on donor funding. It has the vision to export into the niche market unfortunately it is unable to ensure consistency in quality and quantity of cocoa produced by its farmers. Its marketing operation is limited to the domestic market, buying wet beans and dried beans from its members and on-selling it to a local exporter.

Image 3. CASE 1's cocoa buying station, which includes storage facility and a small office

4.3.3. Value adding business strategy

CASE 1's vision was to export cocoa and to exploit niche markets, but the Cooperative had not met the quantity, quality or value-adding levels required to escape the local commodity market for dried cocoa beans. Value adding is limited to processing wet beans into dried beans. Image 4 shows these dried beans on the drying trays. Opportunities to add value through organic and Fairtrade certification exist, but the directors were not familiar with the processes or standards required for certification. They lacked information and marketing expertise, and relied on Cocoa Board officers to seek market opportunities.

To secure cocoa for the commodity market, the Cooperative has to offer growers prices that will attract large volumes of cocoa in order to reduce unit processing, storage, transport and transaction costs, and to negotiate favourable selling prices with exporters. Considering that CASE 1's fermentary and dryer were grant financed, the Cooperative should have been in a position to offer patrons attractive prices. But this was not the case.

At the time of the study, the Cooperative collaborated with a local exporter to set up its buying point. As described by 1H, under this collaborative arrangement, it would buy dry

cocoa beans at a price set by the exporter and receive a 2% bonus on every bag supplied. The exporter would also provide a storage container, transport and an employee to operate the buying station. Directors 1A and 1B, and member 1D, confirmed that the exporter paid an additional US$ 93.00 for the use of the Cooperative's premises. This is a beneficial arrangement for CASE 1, as it cannot meet the requirements set by the Cocoa Board to obtain a dry bean dealer licence. It is not able to meet a performance target of 150 ton per annum (it is only able to meet 80 ton per annum[3] which is about half of the target quantity), nor does it have expertise in quality control, trading and marketing of cocoa. Moreover, it could not afford quality check equipment such as grinders, sorters' trays, moisture meters and other cut test equipment required for quality control. These resources are provided by the exporter.

The collaboration with the exporter is not a legally binding arrangement. According to 1A and 1H, the arrangement between the Cooperative and the exporter is based on verbal agreements. The exporter is not involved in any way in the governance and decision-making of the Cooperative. In addition, there are no conditions for the quality, timely delivery or quantity to be met.

CASE 1 and its collaborating exporter can be classified as small players in the domestic market for cocoa. This particular exporter only operates within ENBP and is not as competitive as the leading exporter as it only has a 2% market share of the domestic dried beans. CASE 1's operation is small and limited to domestic marketing only. Records from the export company shows that from 2014 to 2016, CASE 1 has supplied, 238 ton of cocoa to the exporter. This amounted to less than 1% of the exporter's cocoa purchases from 2014 to 2016.

Under this arrangement, members 1D, 1E, and 1F complained that prices offered by the Cooperative were lower than those offered by rival exporters. 1D, a registered member, recalled his experience:

[3] This is based on total production of 238 ton over a three year period from 2014 to 2016.

On two occasions, I sold bags of dried cocoa to a rivalry exporter. It was during a meeting day, the members and directors witness the exporter's truck pull up next to my house, loaded my bags of cocoa and drove off…It was my way of showing, I was not happy with the price offered by the Cooperative.

The Cooperative was paying its members the same price offered by the local exporter. Members were not receiving the 2% offered by the exporter. 1A claimed this 2% paid for labour work in the processing unit and cocoa farm.

Side selling is a common problem in traditional marketing cooperatives as members have a preference for short-term gains when patronage is not proportional to investment and there are no prospects of realising market-related capital gains. In the presence of side selling, cooperatives struggle to build relationships with premium buyers as they cannot supply consistent quantities of quality product.

Image 4. Dried cocoa beans after being heated over the dryer for three days

In summary, CASE 1's value-adding activities fell a long way short of its goals. The Cooperative processed wet beans into dry beans but did not offer its members competitive prices for their cocoa. Members had little incentive to sell their cocoa to the Cooperative as

prices were low and they could not realise long-term benefits through market-related capital gains. Side selling reduced the volume of cocoa delivered to the Cooperative. This, in turn, created cost inefficiencies in processing and undermined the Cooperative's ability to meet the quantity, quality and consistency requirements of premium buyers in the commodity market.

4.3.4. Institutional and governance arrangements

The Cooperative adopted conservative institutional arrangements that were unlikely to support a value-adding business strategy. It issued 500 membership shares, each with a nominal value of US$155.6[4]. Membership was restricted to individuals who owned and farmed cocoa trees within in the catchment area served by the Cooperative. Patrons must purchase a minimum of one share to become registered members. At the time of the study, the Cooperative had 500 members, of whom only 13 were registered (i.e., fully paid-up) members.

The intention was to finance unpaid shares from payments owed to patrons for their cocoa. However, farmers avoided these deductions by selling their cocoa to other buyers. This situation is likely to persist, as CASE 1's constitution does not impose a limit on the time taken to pay for shares in full. Moreover, 1A and 1C noted that the board had an incentive to treat all patrons as full members because the Cooperative required large numbers to qualify for donor projects such as the PPAP. All of CASE 1's members, both registered and non-registered, were small farmers.

CASE 1's intention was to raise US$ 77,981 in equity capital. However, the Cooperative raised only US$ 5,844 as members avoided equity payments by side selling. This equity capital financed cocoa purchases. Respondents 1A, 1C, and 1D confirmed that the Cooperative had financed its durable assets from grants provided by the government and donors.

[4] This share value is calculated to be 18% of the average income of a smallholder cocoa farmer in a year. This is based on the average annual income of US$ 888.77 per annum (Omuru et al., 2001).

Membership shares are redeemable, non-tradable and non-appreciable. Members can transfer shares with the board's permission. The Cooperative will redeem members' shares at their nominal value plus 'interest' if they exit, but only when the Cooperative can afford to make the payment. 1A reported that no members had formally withdrawn from the Cooperative since the time of its establishment. Nevertheless, CASE 1 is exposed to redemption risk.

Registered members are entitled to one vote regardless of the number of shares held. Non-registered members are not entitled to vote but this rule was ignored when directors were nominated and elected. Members are grouped into geographic zones with each group nominating one director to represent its interests on the board. Since the zones are of unequal size, members of larger groups effectively have less representation than do members of smaller groups, so control of the Cooperative is not strictly democratic.

The Cooperative is controlled by a board of seven directors and a manager appointed by the board. All of the directors are members of the Cooperative, and were nominated and elected by members at an annual general meeting. 1A described the process as follows:

> *Members sat in their respective community zones, then they nominated a candidate from within their community zones. Members knew who were the potential leaders in their own communities and immediately nominated them… In many of the zones, the nominees were unopposed so they instantly qualified as directors.*

Members cast their votes by a show of hands, although the Cooperative's constitution does provide for secret ballot. According to 1D:

> *"We have not had an election lately but I remember the last time we had elections, I put my hands up to vote for the nominee of my choice, I did not write their name down on a piece of paper."*

All members voted irrespective of their payment status. This contradicted the Cooperative's constitution, which restricts voting rights to members who are fully paid-up.

Only one of the seven directors had more than a primary school level of formal education. All of the directors were experienced cocoa producers. Most of them had worked on cocoa plantations in East New Britain, and had managed their own farms for more than 20 years. The chair of the board had previously worked for a bank. His off-farm experience had been invaluable to the development of the Cooperative.

Directorships have a three-year term, and directors can serve a maximum of two terms. However, the chairperson was in his third term. 1A stated that no one else was qualified and willing to take up this role. The board usually meets on a quarterly basis. 1B and 1C claimed that board meetings focussed mostly on donor projects rather than the Cooperative's own vision and business strategy. Nevertheless, respondents were all of the opinion that external agencies did not influence the board even though the Cooperative relied heavily on government and donor funding.

Appointment of competent managers and officers had been problematic. Initially, the board appointed a former employee of the Department of Trade and Commerce to manage the Cooperative. A former teacher served as the Cooperative's secretary, and a former provincial administrator as its treasurer. Neither of these officers, nor the chairperson, had first-hand experience managing a large commercial business operation. 1A explained that initially the Cooperative was able to pay its officers but was no longer able to finance these positions. At the time of the study, the chairperson was acting as manager without remuneration. The secretary and treasurer positions were vacant.

1D, 1E, and 1F claimed that the board did not call AGMs regularly, although members did meet most weeks to discuss progress with the PPAP project and to inform members of activities planned by the board and project partners. Image 5 captures some of the members after their usual PPAP project meeting. Transparency was lacking. According to the Cooperative's constitution, the board must give members a fortnight's notice of an AGM, along with access to the Cooperative's financial statements. 1D, 1E, and 1F complained about the absence of verified financial reports. Although 1A submitted an annual report for 2015 to the CSU, the report did not present a formal Balance Sheet or

Profit and Loss Statement. This was attributed to financial difficulties experienced in 2012 that had obliged the board to lay off the Cooperative's secretary, treasurer and manager. These financial problems had also prevented the board from appointing an external auditor, and the CSU did not provide an auditing service. Nevertheless, CASE 1's cashbooks were readily made available to the Researcher and appeared to be in good order.

Members do not participate directly in strategic or operational decision-making, unless they involve the alienation or acquisition of significant assets. 1A claimed that members participated in a decision to pledge the Cooperative's truck as collateral for a loan taken to finance land. The bank repossessed and sold the truck when the Cooperative defaulted on its loan repayments in 2011.

Image 5. Members of CASE 1 gathered for their weekly meeting

In summary, it is evident that many of the Cooperative's patrons did not invest in the Cooperative, investment is not proportional to patronage, and there is no system of tradeable delivery rights. Members' prospects of realising capital gains are slim and certainly not market-related. Control of the Cooperative is not strictly democratic. Members and external stakeholders do not participate in decision-making, but the Cooperative is closely engaged in donor and government supported projects. Directors lack off-farm business skills and the Cooperative cannot afford to hire a manager, treasurer or secretary.

4.4. CASE 2

CASE 2 operates a natural rubber processing plant, which produces TSR, a dry natural rubber product processed to meet a specific technical standard. At the time of the study, the owners were small rubber farmers and a rubber trading company. The Company began as a joint venture between the rubber trading company and a trust funded by a mining company in 1993. Over the years, it has adopted a hybrid cooperative type structure but is still registered as a company. It is the second largest rubber processing operation in PNG. It produced 19% of the total processed rubber exported from 2013 to 2015[5].

CASE 2 has 3,757 patron members. These members own 400 to 1,500 trees of rubber and have the capacity to produce an average of 5,600 kilogram of raw rubber per annum. These farmers are located in 104 villages in the Western province of PNG, mostly in mining affected areas and in the remote areas along largest river in PNG. Apart from royalty payments for those in the mining affected areas, rubber farming remains the main source of livelihood.

Ten respondents were interviewed. These respondents are coded in the case descriptions as 2A to 2J. The respondents included five directors, two representing the rubber trading company and three representing the small farmers, three patron members, one manager and one stakeholder. The interviews were conducted in English and the common local language, Pidgin. These interviews were audio recorded with consent of the respondents.

4.4.1. Background and history of the rubber industry

Rubber is a small industry compared to cocoa. According to the Bank of PNG (2016), rubber contributed an average of US$ 6 million per annum to the economy of PNG for 2010 to 2016, whereas cocoa, contributed US$ 79 million per annum, which is ten times as much as the rubber industry.

[5] This is calculated from 8,800 ton of rubber exported of PNG from 2013 to 2015 (Bank of PNG, 2017).

There has been a significant decline in the rubber industry. In the 1950's the industry contributed 12% of the total agricultural export returns (Allen et al., 2009). This has dropped to 1% since the 1980's and has continued to remain like this since then (Allen et al., 2009). The decline was attributed mainly to the decrease in the planation sector and the inability of small farmers to sustain production. The reasons for the decrease in the plantation sector are similar to those of the cocoa industry; mainly the high cost of labour, land disputes, and compulsory government land acquisition (Allen at al., 2009). PNG's Department of Agriculture and Livestock reports that in 2012, there were 18,000 hectares of land planted to rubber but only 30% was in production. This low rate was due to low rubber prices coupled with poor accessibility, poor transport, and lack of access to marketing services (Bunger & Smit, 1997).

The product flow of rubber in the domestic setting begins at the farm gate as rubber latex, and ends at exporter premises as processed dry rubber. Figure 3 outlines this product flow. First, on a rubber farm, the latex from the rubber tree is harvested by tapping the tree. This is done by making an incision in the bark of the rubber tree. The latex is then collected in cups and left to naturally coagulate. For the farmer, the process ends when the rubber is naturally coagulated. This differs from ribbed smoke rubber where the latex is coagulated under controlled conditions and then pressed through rollers to create sheets that are smoked dried. Second, the farmer collects the coagulated rubber and stores it ready for sale to a trader or directly to a processor. The traders are responsible for collection, storage and transportation to the nearest processing plant. Once the rubber arrives at the processing plant it is cut up and blended. Then it passes through three levels of grinding and washing. The clean rubber is extruded into a noodle-like mass, which is dried by hot air and finally compressed into slabs of dried rubber ready for export. Image 8 shows an example of rubber after that has been grinded, washed and extruded into the noodle-like mass at CASE 2's processing plant. Before an export certificate is issued, rubber samples are sent to approved testing laboratories outside of the province. If the standards have been attained the rubber is wrapped and packed into palletised bales ready for export.

At the production level, a characteristic of the industry is that there is an equal supply of raw rubber produced by plantations and small farmers. According to Allen, Bourke and

McGregor (2009) there are 6,700 small farmers who cultivate 8,400 hectares of rubber. Three large plantations and other small plantations cultivate another 8,300 hectares of land. The largest plantation is run by a foreign owned company and contributes 32% of the total production (Allen at al., 2009). For small farmers, 71% of the total production comes from the Western and Central province with 25% and 46% each respectively. These are the only provinces with operational processing plants.

In terms of domestic trading, processing and exporting, two companies dominate. A foreign owned company located in the Central Province and CASE 2 located in Western Province. These two companies successfully operate processing plants at full capacity. In addition, they have integrated the role of producers and rubber buyers (Allen et al., 2009). The foreign owned company produced 85% of the total rubber exported in 2006 and buys raw rubber extensively in PNG (Allen et al., 2009). In total, there are four factories producing TSR in PNG, however, two factories owned by the government were operated below capacity due to the low supply of rubber (PNGDAL, 2007). In terms of rubber trading, there are also rubber traders who export natural rubber without processing. The Department of Agriculture and Livestock do not permit the exportation of raw rubber but there are no laws in place to stop this from happening.

In comparison to the cocoa industry, the processing cost of rubber is higher than that of cocoa. Processing for cocoa requires fermentary and drier units, which come at a reasonable cost. While in the case of rubber, processing requires significant investment in processing plants. The cost of establishing a small processing plant like that of CASE 2 was less than US$100,000. Without processing small farmers receive a small fraction of the total export price. Prices received by small farmers can drop as low as US$ 0.13 per kilogram for dry rubber content equivalent (Pacific Islands Report 2010: Bunger & Smit, 1997). This is not much when compared to the export price for natural rubber which ranged from US$ 0.50 to US$ 1.20 per kilogram from 1995 to 2005 (PNG Institute of National Affairs [PNGINA], 2006).

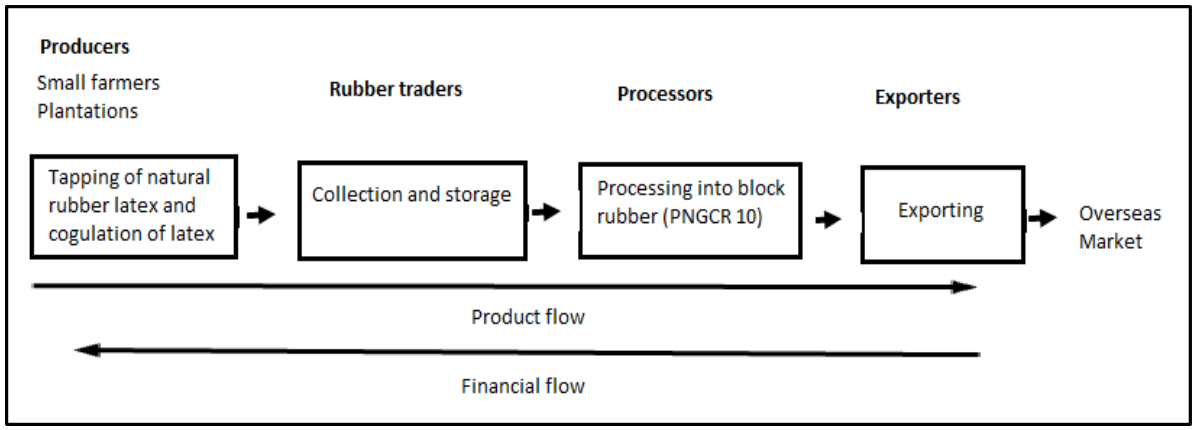

Figure 3. The product flow of rubber in the PNG rubber industry

Western Province is the only province in PNG that has expanded its rubber cultivation while other provinces have seen a decline in the cultivation of rubber and replacement with other crops. CASE 2 is located in this province. According to CASE 2's records of the rubber developments in the province, in 1993 when the Company started, the province had only 1,900 hectares of rubber and 2, 400 growers. In 2016, this increased to 8,900 hectares and 11, 400 growers. These developments were funded by various organisations over a period of time. They included the mining company through its Trust in charge of community development, the provincial government, CASE 2 and another non-profit organisation, which held 52% of the shares in the mining company. Respondent 2J, confirmed the mining company played a major role in funding development projects around the mining areas including CASE 2's establishment. These initiatives are part of its Community Mine Continuation Agreement with all communities affected by the mining. Under this agreement, it is expected to pay compensation, investment and development payments to the 158 communities within its vicinity. This agreement was essential to the granting of its social licence to operate in PNG.

Image 6. Noodle-like masses of rubber after being processed through an extruder at CASE 2's processing plant

To sum up, rubber industry is a small industry made up of small farmers, plantations and two larger companies which dominate the processing companies. Western Province is the only province in PNG that has seen increase in rubber production. This is made possible through the presence of the mining company and its effort to honour its social obligations to affected communities.

4.4.2. Core business and objectives

A key driver for rubber development in the Western Province has been the success story of CASE 2, which has operated a natural rubber-processing factory for the last 23 years. Image 7 shows the setup of CASE 2's rubber processing plant. CASE 2 began as a joint venture between a rubber trading company and a mining company development trust in 1993. Over time, CASE 2 transformed to a hybrid cooperative structure, however, it still maintains its status as a limited liability company. Its shareholding from small farmers has increased from 1% of total shareholdings in 1994 to 79% in 2016, so it has been able provide a source of income for its rubber farmers. Its 2015 annual report states it has paid out US$ 14 million

directly to its farmers since 1994 for raw rubber production and an additional US$ 2 million remains as assets belonging to the shareholder farmers.

Image 7. Interior setup of CASE 2's processing plant, on the left is the extruder, centre is the drier unit and on the right is the compressor

Prior to the establishment of CASE 2, a rubber trading company was in operation since the introduction of rubber in the province in the 1960's. This company is a subsidiary of a retail and hardware company established in the 1960's. This company is co-owned by the people of Western Province. 2I confirms that this company has been an important strategic partner in CASE 2, providing strategic directions, expertise in rubber trading, necessary transport requirements, business administration and management. The rubber trading company owns a fleet of three river vessels (50-140 tonne capacity). These vessels are hired by CASE 2 for rubber collection and buying along the river.

Since the drop of the rubber price in 1980, trading of raw rubber had become an uneconomical exercise. As 2A recalls processing companies were buying unprocessed rubber at less than US$ 0.33 per kilogram for dry weight. The cost of freight to ship the

unprocessed rubber to the nearest processing plant was also high as US$ 0.33 per kilogram. The high moisture level in unprocessed rubber meant increased freight cost and a decrease in profit margins.

2A shared his experience of establishing one of the first rubber trading company:

"*I encouraged rubber planting in 1967 and having put the people to hard work. I was always looking for ways so they could always sell their rubber. That is why we formed the rubber trading company in the first instance, to buy rubber and ship it out to the nearest processing plant. Then when we could not a good price from the processor, we stockpiled the rubber so we could start our own processing plant. Processing has always been the intention because raw rubber always has at least 40% water in it and to ship 40% water to Port Moresby or anywhere is really a waste, a big waste. So, the idea is to process the rubber until we are shipping pure dry rubber and only paying freight on pure dry rubber*."

As pointed out by 2A the cost of transporting water contained in the raw rubber was uneconomical considering the low price of rubber. Given this circumstance, CASE 2 was established with the aim to increase returns on raw rubber to sustain the livelihoods of farmers who depend on this rubber. Image 8 shows the farming families along the river who depend on rubber as a main source of livelihood. As stated in CASE 2's 1996 annual review report, its primary objective was to produce a consistently, high quality processed rubber that is competitive on the world market. It has been able to achieve this through the construction of a factory funded by the rubber trading company, the trustee of the mining company and loan capital. CASE 2's 2015 annual report states it has exported 16,618 ton of technical specified rubber worth US$ 24.1 million since establishment. A subsequent objective was to secure rubber growers' interests. It intends to achieve this by sustaining a price no less than US$ 0.13 per kilogram. 2A and 2B point out that unlike other crops in PNG that have stabilisation funds established by the government, rubber has never had a stabilisation fund as the industry's return is not sufficient to sustain a stabilisation fund scheme. CASE 2 was able to retain a surplus from trading to establish its own stabilisation funds.

Image 8. Farming families along the river of Western Province gathered to sell their raw rubber to officers of CASE 2

A strategy to ensure the sustainability of its operation was to invest in new rubber planting development. This is reaffirmed by its objective to improve production techniques with the assistance of the Department of Primary Industry and to support industry development with the assistance of the trustee of the mining company. The Company has invested US$ 0.83 million, which constitutes 8.6% of a total of US$ 9.6 million put into new planting of rubber by development partners.

4.4.3. Business strategy and value adding

CASE 2 sells TSR denoted as PNGCR10 (PNG Classified Rubber grade 10). This is a rubber product made to the specification of buyers overseas for making tyres and seaport fenders. PNGCR10 is the highest quality rubber derived from naturally coagulated rubber. The parameters for determining the grade is the maximum level of moisture, dirt, volatile matter, nitrogen and sulphur permitted in the rubber. In addition to this, the plasticity of the rubber, before and after, heating is measured. The levels of these parameters for PNGCR10 are higher compared to the standards from Malaysia and Indonesia. The lowest grade of rubber is “TSR 50”, which is made from ground spills and recycled rubber. The

Company does not have its own laboratory to test its rubber but sends samples of its rubber elsewhere in PNG to be tested.

In order to acquire sufficient supply of raw rubber to process, CASE 2 uses its own vehicles to buy rubber from its farmers along the roads and river. For farmers along the river, it uses river ferries owned by the rubber buying company to do this. CASE 2 pays freight to the rubber trading company at a subsided rate. CASE 2 purchases rubber at a lower rate for farmer located in remote areas along the river. This is to accommodate for freight costs. Respondent 2F, whose farm was along the river reported he received US$ 0.06 less for every kilogram compared to members closer to the processing plant.

Once the rubber arrives at the processing plant it is processed as described in Section 4.4.1 in the product flow of rubber. For quality purposes, samples have to be sent to a certified laboratory to ensure the parameters stated earlier have been met. If the standards have been attained the rubber is wrapped and packed into palletised bales ready for export. Image 9 shows the final product of CASE 2, palletised bales of rubber, labelled with importer's address and ready to be shipped out. The processed rubber is shipped out of the province through arrangements made with the mining company to backload empty containers returning to the main port in the capital city.

The processed rubber is exported to Australia, Germany and China. The product is sold to processors specialised in manufacturing dock fenders, mountings and tyres. There have been occasions when the processed rubber was sold through an agent particularly when quantity requirements were not met.

Image 9. Packed dry rubber ready for export in CASE 2's warehouse

4.4.4. Institutional and governance arrangements

CASE 2 has two classes of shares, external investor shares and ordinary shares. The Company's strategic partner owns its external investor shares. Initially, the Company had two strategic partners but one of the partners exited in 2015, gifting its shares back to the Company. The external investor shares are redeemable, transferable and appreciable. Each of these shares confers a voting right and a fixed annual dividend equal to 12% of its initial book value on its owner. Unlike ordinary shares, the external investor shares are redeemable and the Company will redeem them at their audited book value when the investor exits. Equity capital contributed by the external investors financed the Company's establishment and its processing plant.

The Company's ordinary shares are owned by the small farmers who supply it with rubber. These shares are non-redeemable, transferable, and appreciable. The Company's constitution provides for a share-trading platform administered by the Company's directors on behalf of its ordinary shareholders. The directors will offer a seller's shares to ordinary shareholders at a price agreed with the seller, or at a price set by an external auditor if the

seller and directors do not agree on a price. If there are no willing buyers amongst the shareholders, the directors will offer them to other farmers in the Western Province who can supply the Company with rubber. However, farmers are not required to buy shares in proportion to their patronage. Like the Company's external investor shares, each ordinary share confers a voting right and a fixed annual dividend equal to 12% of its original book value on its owner. Dividends are payable when the Company has a cash surplus.

Shares were issued at a price of US$ 0.33 per share in 1993. The book value of shares had grown to US$ 2.04 in 2015, with an aggregate value of US$ 1.2 million. The strategic partner owns 100,007 external investor shares, and small farmers own 376,950 ordinary shares. Respondents 2A and 2B expected the uptake of ordinary shares to increase as more cultivated rubber came into production. The Company was still offering ordinary shares (not yet taken up) at a price of US$ 0.33 per share to encourage more farmers to supply raw rubber to its processing plant.

In 2014, the Company bought back 40,713 shares from 293 ordinary shareholders at a price of US$ 3.02 per share. The Company's auditor set this price. According to respondent 2B, the rationale for this exercise was to ensure that ordinary shareholders had equal voting rights. Following this once-off buy-back, none of the farmer (patron) shareholders owned more than 100 ordinary shares. At the time of the study in 2016, the farmers collectively held 79% of the Company's total shareholding, and the external investor held 21%. Although the farmers collectively possess a majority of the voting power, the constitution allows the strategic partner to appoint five of the board's ten directors, including the chairperson who has a casting vote. This effectively gives the strategic partner, a minority shareholder, control of the Company.

This apparent imbalance in control could be criticised as unfair and the source of a serious influence problem. However, when viewed in the context of a temporary partnership where the intention is to pass ownership and control to empowered farmers, the influence 'problem' is precisely what makes the Company creditworthy while the strategic partner trains and mentors the farmers and their elected directors in the application of good governance and management practices.

Training of small farmers has been an on-going process to ensure they are acquainted with their roles and responsibilities in the Company. 2C, 2D and 2E confirmed that they received specialised training facilitated by the mining company for local business owners operating within the vicinity of the mine. This provides an indication of the on-the-job training and mentoring provided by the strategic partner.

Three of the five directors representing farmer's interest were nominated and elected by ordinary shareholders at annual general meetings. 2G and 2H indicated that the remaining two directors were nominated and elected by ordinary shareholders at meetings called in their own production zones. The Company's constitution provides for polls by secret ballot but the elections were conducted by a show of hands, plus proxy votes submitted on forms delivered to shareholders in more remote areas. In respondent 2G's words:

> "*I am an 'ordinary' class shareholders and only 'ordinary' class shareholders can nominate and elect small farmers as directors… external investor shareholders are different.*"

A democratic voting process is consistent with proportional voting rights when shareholders own similar numbers of shares, but voting by a show of hands tends to skew results in favour of influential candidates. Ordinary shareholders did not participate in board or management decisions but they did vote on resolutions with significant financial or constitutional implications, as required by the Company's constitution.

At the time of the study, CASE 2 had five farmer directors, and four directors representing the interest of the strategic partner including the chairperson. The strategic partner's representatives were formally qualified and experienced directors. The chairperson is a prominent business personality in PNG, and managing director of a group of companies involved in transportation, auto-repairs and accommodation services. The strategic partner's representatives also held senior positions in this group of companies, several of which had been operating successfully since 1969. The outgoing general manager, an expatriate from Malaysia with over 30 years' experience in rubber processing technology,

had recently been replaced by a qualified accountant and experienced manager, also from Malaysia. Two of the farmers' representatives had served as directors on CASE 2's board for more than ten years. One of these directors was a former teacher, and the other held a tertiary qualification. The others farmer directors are respected leaders in their communities.

In addition to the aforementioned directors, the board also has two associate directors - one representing the interests of provincial government agencies, and the other the interests of a major shareholder in the mining company that helped to establish CASE 2. The provincial government has been a long-time sponsor of smallholder rubber development and rehabilitation projects. CASE 2 implements and manages some of these projects. Associate directors participate fully in board meetings but do not have voting rights.

In summary, CASE 2 is a company that operates like an investor-share cooperative. The strategic partner owns redeemable shares while patron members own non-redeemable shares. Both classes of shares are appreciable and therefore allow shareholders to realise capital gains. The strategic partner redeems shares at their audited value, while patron-members receive the market price for shares traded on platform managed by the board. However, investments are not proportional to patronage, and there are no tradeable delivery rights. The strategic partner retained a voting majority on the board even though patron members had become majority investors. This imbalance was intended to be a temporary arrangement while the strategic partner embedded good governance practices and mentored inexperienced directors. Directors take strategic decisions and managers are responsible for operational decisions. Ordinary shareholders participate in decisions only when these decisions have significant financial or constitutional implications.

Chapter 5

Results and discussion

5.1. Introduction

This chapter draws on the case descriptions in Chapter 4 to test propositions listed in Chapter 3. These propositions relate a cooperative's value-adding performance to its institutional and governance arrangements. Section 5.2 summarises the value-adding activities observed in each case, and Section 5.3 presents a pattern matching analysis of their institutional and governance arrangements. The chapter concludes with a discussion of the findings in relation to cooperative development in PNG, and discusses other factors that may have affected the performance of the organisations studied.

5.2. Observed value adding performance for CASE 1 and CASE 2

CASE 1's intended objective was to access niche markets for dry cocoa beans. It had not achieved this objective. Despite being gifted fermentaries, a drier and a truck, the Cooperative was unable to transport and process cocoa beans at low cost and did not secure a premium price from domestic buyers, nor did it obtain export status. As a result, the Cooperative did not offer patrons competitive prices for their cocoa and failed to attract even the modest volumes required to operate their plant at capacity. The Cooperative sold a meagre 238 ton of cocoa between 2014 and 2016. This represented less than 1% of their buyer's total export volume. Management decided to supplement patron deliveries by producing its own cocoa and pledged the Cooperative's truck as collateral for a loan to purchase 10 hectares of land. The lender repossessed the truck when the Cooperative defaulted on its loan. The Cooperative established cocoa trees on its land and the yield from these trees will fully utilise the capacity of its fermentaries and drier. Without additional processing capacity, the Cooperative will not be in a position to purchase wet beans from patrons, and patrons are therefore unlikely to benefit from value-adding unless more capital can be raised to extend its processing plant. The analysis of the Cooperative's institutional arrangements in Section 5.3 sheds light on its ability to raise equity and debt capital.

CASE 2, on the other hand, did achieve its objective of processing raw rubber into technical specified rubber, and had sustained its operation for 24 years. This required significant

capital, which was raised by establishing a creditworthy company with two strategic equity partners. The Company's value-adding performance was exceptional. The Company's nominal net worth grew at an average rate of 1.1% per annum (adjusted for inflation) between 2010 and 2015. The audited value of its shares grew from PGK 2.29 per share in 1993 to PGK 6.50 in 2015 when measured in constant (2015) prices (representing a real growth of PGK4.21) with patrons accounting for 79% of the shareholding. Since its establishment, CASE 2 had purchased 30,000 tons of raw rubber from smallholders, and exported 17,000 tons of processed rubber. Patron's earned US$13.6 million from rubber sales and received a dividend of 12% per annum paid on the initial value of the shares every five years.

5.3. Observed institutional and governance arrangements

Table 2 presents key institutional attributes identified by the NIE (Chapter 2) as factors likely to influence the value-adding performance of producer organisations. These theoretical relationships were specified as a testable proposition in Section 3.2. Table 2 expresses the attributes as solutions to institutional problems associated with traditional cooperatives and codes them with a tick (✓) to indicate the presence of an investor-friendly attribute, or a cross (X) otherwise.

CASE 1 and CASE 2 differ markedly in respect of their institutional attributes. CASE 1 adopted the investor-unfriendly features of a traditional cooperative. Investors cannot realise capital gains, nor can they prevent non-investors from capturing the benefits of their investment. They do not benefit from greater control over cooperative decisions, nor can they disinvest when directors and managers make poor decisions. Not surprising, fewer than 3% of the shareholders had paid for their shares, and donors financed all of the Cooperative's assets. Apart from discouraging investment, CASE 1's institutional attributes also encouraged side selling. Incentives to comply with contracts diminish when the benefits of compliance cannot be realised through future capital gains, and the cost of negotiating supply contracts increases when investment is not proportional to patronage. The Cooperative did not link patronage to appreciable shares and persistent side selling prevented the Cooperative from building the volumes it needed to offer patrons

competitive prices. It is understandable that management did not specify supply contracts as enforcement costs increase when members have little incentive to comply with their terms.

Table 2. Comparison of institutional arrangements observed in CASE 1 (poor value-adding performance) and CASE 2 (good value-adding performance)

Institutional attributes	Institutional problems alleviated	Traditional cooperative	CASE 1	CASE 2
Capital gains realised by revaluation of the share price or by issuing bonus shares	Horizon problem	X	X	✓
Producer organisation issues a class of non-redeemable shares	Redemption risk	X	X	✓
Capital gains realised by trading shares at market price	Horizon, portfolio & control problems	X	X	✓
Investment proportional to patronage	Internal free-rider problem & high transaction costs	X	X	X
Non-member patrons do not benefit from favourable prices offered to members	External free-rider problem		X	✓
Producer organisation issues tradable delivery rights	All the above problems	X	X	X
Voting rights are proportional to investment	Influence problem	X	X	✓

In contrast, CASE 2 has several investor-friendly attributes. These attributes enabled the Company to attract capital from strategic partners and farmers. Initially, the equity capital, expertise and markets introduced by two strategic partners lent credibility to the Company enabling it to finance a processing plant from both equity and debt capital. One of the strategic partners invested largely to safeguard its mining interests in the province, the other to secure supplies for its rubber trading business. In essence, the mining company provided grant capital as it later withdrew from CASE 2 leaving its capital in the business. The rubber trading company, on the other hand, had a long-term interest in the success of the joint venture to secure high quality rubber for its foreign buyers. For rubber producers,

the rubber trading company represented a strategic partner with common interests and complementary resources.

It is not clear what each of the initial strategic partners contributed to the design of CASE 2's institutional arrangements but several unique features emerged in this process. Importantly, shares issued to farmers and strategic partners differed in that farmers' shares were non-redeemable and tradeable, whereas those held by the strategic partners were redeemable. At first glance, this arrangement appears to favour strategic partners as it gives them a 'buyer of last resort' option, and a price at least equal to the current audited value of the Company's shares. Farmers, on the other hand, confront the vagaries of an illiquid market for their shares in a company exposed to redemption risk. However, it is important to temper this negative view with what the Company achieved in terms of adding value and sharing benefits with farmers. The rubber trading company may not have invested in the joint venture without a predictable exit mechanism. Redeeming shares at their current book value amplifies redemption risk, but also encourages strategic partners to grow the value of the Company before they exit, and gives farmers control over the entry of new partners.

The data presented in Table 2 support propositions (a) and (b) in Section 5 that producer organisations are more likely to sustain value-adding activities if they adopt market or non-market mechanisms that permit investors to realise capital gains. The data also support the NIE view that performance improves when institutional arrangements eliminate external free riders, but are not entirely consistent with proposition (c) in Section 3.2 that producer organisations are more likely to sustain relationships with downstream buyers if patrons are obliged to buy tradable shares or delivery rights in proportion to their patronage.

Proportionality between patronage and investment helps to align the interests of patrons and investors and encourages patrons to meet their commitments to supply the organisation. The incentive to comply is stronger still when patrons can realise the future benefits of long-term supply relationships established with downstream buyers through capital gains. While the absence of these institutional arrangement helps to explain pervasive side-selling in CASE 1, there was no evidence of this problem in CASE 2 even though it, too, did not require patrons to invest in proportion to their patronage. A likely

explanation for this anomaly is that CASE 2 did not face competition from other, local rubber buyers. The Company's decision to equalise patron shareholding through its buy-back scheme would also have helped to improve proportionality between patronage and investment as the patrons owned most (71%) of the Company's shares and (as smallholders) had similar levels of production.

Lastly, the data presented in Table 2 appear to support the NIE argument that a lack of proportionality between investment and voting rights can lead to influence problems that discourage investment and lending. However, it is unlikely that proportional voting rights in CASE 2 had much to do with its relative success as the impact of voting rights was diluted by governance arrangements in both cases. Table 3 summarises key governance attributes associated with the value-adding performance of producer organisations. These relationships (discussed in Section 3.4) were reduced to a testable proposition in Section 3.2. As in Table 2, ticks (✓) indicate the presence of 'good' governance attributes observed in each case, while crosses indicate their absence.

Table 3. Comparison of governance arrangements observed in CASE 1 (poor value-adding performance) and CASE 2 (good value-adding performance)

Governance attributes	CASE 1	CASE 2
Shareholders nominate elected directors	✓	✓
Elected directors outnumber any other directors	✓	✓
Elections are conducted by secret ballot	X	X
Board has the authority to hire and fire executive managers	X	✓
Members do not participate directly in decision-making	✓	✓
Organisation specialises in a single product	✓	✓
Producer organisation has qualified directors	X	✓
Presence of qualified and experienced manager(s)	X[1]	✓

Note: 1. CASE 1 did not have a manager at the time of the study.

The evidence presented in Table 3 shows that CASE 2 had a predominance of good governance arrangements compared to CASE 1. A weakness common to both cases is the

election of directors by show of hands rather than by secret ballot. This process can introduce influence problems, as smallholders may feel obliged to nominate and vote for local authorities whose interests do not align with those of the shareholders. CASE 1 suffered additional weaknesses. Firstly, it could not afford to hire a manager and the board's chair had assumed the management role. This compromised the ability of the board to sanction or fire the manager for poor performance. This governance problem may well have contributed to the Cooperative's financial difficulties. Secondly, it lacked qualified and experienced directors. In both cases decision-making was entrusted to a centralised decision-making body (i.e. members did not participate directly in decision-making). However, CASE 1 did not have a manager and lacked competent directors. CASE 2, on the other hand, benefitted from knowledgeable and experienced directors and managers introduced by its strategic partner.

The data in Table 3 mask a recent influence problem in CASE 2 that could undermine its good performance in the long-term. The Company issued ordinary shares to its small farmers, and redeemable shares to its strategic partner. Each of these parties nominates and elects its own directors to the Company's board. Initially, smallholders were entitled to elect three directors, whereas the strategic partner was entitled to elect five directors. These arrangements afforded smallholders greater representation and exposure to decision-making than their investment warranted, but ensured that control remained with the majority investor. When smallholders overtook the strategic partner as the majority investor, it was agreed that both parties could elect five directors to the board. However, the board's chair was reserved for a director nominated by the strategic partner, and the chairperson was given a casting vote that effectively kept control in the hands of the strategic partner. This imbalance may have a short-term advantage in maintaining the Company's creditworthiness while farmer-elected directors are still 'in training', but other governance arrangements could afford much the same protection without exposing the Company to political criticism and a potentially damaging influence problem. For example, smallholders could nominate and elect credible outsiders as additional directors or associate directors with voting rights on the board.

5.4. Discussion

The conceptual model in Section 3.2 postulates that producer organisations with investor-friendly institutional and governance arrangements are more likely to achieve their value-adding objectives than are those that adopt the institutional arrangements of a traditional cooperative. The findings of this study support this premise. The successful rubber company issued shares that were tradable and appreciable, and provided a trading platform for shares owned by farmers. The shares also conferred voting rights. These institutional arrangements allocate capital gains and control of the organisation to investors in direct proportion to their investment. The less successful cocoa cooperative did not adopt these investor-friendly institutional arrangements.

This result is consistent with findings reported by Rosairo, et al. (2012) in their study of farmer-owned marketing companies in Sri Lanka where companies that allocated capital gains to shareholders by issuing bonus shares or tradable shares outperformed those that did not adopt such mechanisms to solve the horizon problem. None of the farmer-owned companies studied by Rosairo et al. (2012) adopted investment proportional voting rights. The rubber company did however, have two potential weaknesses in its institutional arrangements. First, it did not link farmer investment to patronage. This creates a potential free-rider problem and weakens farmer incentives to comply with their supply contracts. The Company alleviated potential free-rider problems by buying back farmer's shares to create a more equal distribution of shares that better matched their deliveries. However, future trading of shares could alter relative shareholdings, resulting in a misalignment of farmer interests as patrons and investors with adverse consequences for investment and contract compliance. The cocoa Cooperative shared this weakness (as did all of the farmer-owned companies studied by Rosairo, et al. (2012)) and succumbed to flagrant side selling. This problem did not emerge in the rubber company, possibly because it had addressed the horizon problem, but more likely because it was the only local rubber buyer. Again, this is a situation that may change in the future and the rubber company ought to consider issuing

tradable delivery rights tied or 'stapled' to their shareholding as they are in some (successful) Australian irrigation cooperatives (Plunkett, Chaddad, & Cook, 2010).

Second, the rubber company created governance arrangements relating to board representation that allowed a strategic partner to retain control of the Company when it was no longer the majority investor. While there may be good reasons to 'create' an influence problem to preserve the Company's creditworthiness, this argument becomes less convincing over time as farmer-elected directors gain management knowledge and experience. Besides, there are alternative ways of protecting the board's credibility that do not disempower smallholders when they become majority investors, and the rubber company ought to consider governance options that allow farmers to nominate and elect external experts to complement directors elected from within their own ranks. In the cocoa Cooperative, voting rights were democratic and not proportional to investment. This embeds a potential influence problem, especially when directors are elected by a show of hands. Rosairo, et al. (2012) observed the same democratic voting rights in all of their Sri Lankan cases, but found little evidence of influence problems when decision-making was centralised in the hands of accountable directors and managers. Esnard (2016: 75-76) made the same observation in his study of four producer-owned marketing cooperatives in the Caribbean region, and Plunkett et al. (2010) stress the advantage of centralised decision-making in their analysis of two successful irrigation cooperatives in Australia. The cocoa cooperative did separate control from ownership, and may therefore be less susceptible to influence problems than its voting rights and procedures suggest.

A cursory analysis of the cocoa Cooperative's lacklustre performance points to problems of inadequate capital, side-selling, and poor management decisions. The failure of PNG's first cooperative movement in the 1970's was attributed largely to these same issues (Mugambwa, 2005). However, this deeper analysis of the Cooperative identified underlying institutional flaws that induce low investment and side selling. While potential influence problems were mitigated by separating ownership from control, the benefits of centralised decision-making were diluted by a lack of high quality directors and managers. Whereas the rubber company was controlled by competent directors and managers, the cocoa Cooperative was controlled by poorly educated farmer directors and managers who had no

previous experience in business management. Given the realities of PNG's smallholder farming sector, this outcome is almost inevitable when cooperatives are obliged to adopt a structure that not only discourages investment, but which also prevents strategic partners from becoming majority or even significant shareholders in a cooperative. Section 60 of PNG's Cooperative Societies Act (1982) prevents any member from holding more than 20% of a cooperative's shares, and the proposed cooperative policy defines membership only in terms of natural persons (CSU, 2008, Section 4.2.4). Lyne and Collins (2008) note that several developed countries have relaxed their cooperative law to allow investment from non-patrons, and that this has resulted in the emergence of hybrid cooperatives that resemble investor-owned firms, but with restrictions on voting power that prevent outright control passing to non-patrons.

Of concern is that PNG's proposed cooperative policy, not only prohibits transactions in member shares (CSU, 2008, Section 4.2.8), but also promotes governance arrangements allowing cooperatives to adopt customary (*wantok*) practices familiar to, and respected by, local communities. Such arrangements could seriously undermine the performance of marketing cooperatives that have value-adding objectives. It is unlikely that shareholders will supply capital and products to cooperatives if they cannot hold directors accountable through their voting power, and if directors cannot hold managers accountable by firing them. Odhuno (2017, p. 5) bluntly criticises PNG's draft Integrated Rural Development Policy as it does not "acknowledge that attempts to run co-operatives the 'PNG way' is the reason the country's co-operatives sector is not well developed".

The cases investigated in this research were purposefully selected to differ in respect of their institutional arrangements while controlling for other determinants of value-adding performance. In particular, both organisations processed a single agricultural commodity sold in export markets, and both were supplied only by small-scale farmers. Nevertheless, other factors did contribute to differences in their performance. First, the rubber company was less vulnerable to side selling than the cocoa Cooperative as it was the only local buyer. That said, the cocoa cooperative did nothing to address the horizon problem that made it prone to side selling. Both organisations could benefit from issuing tradable delivery rights to promote contract compliance. Second, differences in product characteristics also counted

in the rubber company's favour. Rubber is less perishable and subject to less stringent quality standards than food crops like cocoa. Raw rubber can be stockpiled for a year without significant quality losses (Brown, 2001), providing flexibility in the timing of post-harvest processing. Third, while both producer organisations benefited from external support, the source and nature of this support differed. The cocoa Cooperative received donor funding through projects planned by the Cocoa Board, a statutory organisation, and its buying and quality control activities are subsidised by an exporter. Neither of these parties has a financial interest in the Cooperative, nor do they share in its risk. They have no decision-making authority within the Cooperative and no more than an altruistic motive to mentor its directors and managers. This contrasts sharply with the rubber company, which benefitted from equity capital injected by a strategic partner that needed to secure its supply of raw rubber. In this case, the partner shares in the Company's decision-making and its fortunes, and therefore has a strong incentive to improve the efficiency of its smallholder patrons and to mentor their directors.

Chapter 6

Conclusion and recommendations

6.1. Introduction

The aim of this research was to inform cooperative policy and legislation in PNG. Its objective was to examine the institutional and governance arrangements of producer organisations in PNG, and to analyse the impact of these arrangements on the achievement of intended business strategies. This chapter draws on the research questions posed in Chapter 2 to highlight key findings and to make recommendations for policy and legislation. The chapter concludes with the study's contribution to the literature, its limitations and recommendations for future research.

6.2. Key findings

The key findings are presented with reference to the (five) research questions posed in Chapter 2, namely:

1. Do producer organisations apply different institutional and governance arrangements to support business strategies that require different levels of value-adding?
2. Are the institutional and governance arrangements applied by producer organisations affecting the achievement of their intended business strategies?
3. How consistent are these institutional and governance arrangements with PNG's existing cooperative law?
4. Would changes to PNG's cooperative policy and legislation make it easier for cooperatives to achieve their intended business strategies?
5. What other factors contribute to the achievement of intended business strategies?

Case studies were made of two producer organisations that displayed contrasting levels of success in achieving their value-adding goals. Descriptive and comparative analyses of these cases provided a definite 'yes' in answer to research questions 1 and 2. Despite clear differences in their performance, the organisations were essentially following similar business strategies. Both focused on early-stage, post-harvest processing services to access

international commodity markets as low cost producers. There was no attempt to differentiate the product or to exploit premium prices in niche markets. Nevertheless, stark differences in their performance were consistent with theoretical propositions about relationships between a producer organisation's ability to add value and its institutional and governance arrangements. In particular, the low performing organisation operated as a traditional cooperative with redeemable, non-tradable and non-appreciable shares that prevented its patron members from realising future capital gains. This not only discouraged investment, but also encouraged members to take advantage of short-term opportunities by side-selling to other buyers who offered higher prices. In contrast, the high performer issued shares that were appreciable, and operated a trading platform for its non-redeemable shares. In addition, this organisation linked voting power to shareholding, whereas the poor performer exposed its investors to an influence problem by allocating equal voting power to all members regardless of their level of investment. The high performer also exposed its patron members to an influence problem by assigning majority voting power to directors representing its minority investor, and both organisations elected their directors by show of hands – another potential source of influence problems. These threats were mitigated in both organisation by clear separation of ownership and control. Unfortunately, the low performer could not take full advantage of centralised decision-making as it lacked competent directors and managers. Moreover, the directors could not hold the manager accountable for bad decisions as the chairperson also served as the organisation's voluntary manager to ease its financial stress.

With regard to research question 3, the low performer's conservative institutional arrangements were entirely consistent with PNG's existing cooperative law and its proposed cooperative policy, both of which prohibit the adoption of models that reward investors with capital gains (Cooperative Societies Act, 1982, Section 62; CSU, 2008, Section 4.2.8) and extra voting power (Cooperative Societies Act, 1982, Section 77). Its governance arrangements were also consistent with the legislation, which limits membership to natural persons, and directorship to members only (Cooperative Societies Act 1982 Section 67). Additionally, the low performer opted for equal shareholding, which follows the spirit of existing law (Section 60 of the Act prevents any member from owning more than 20% of a cooperative's total shareholding) and proposed cooperative policy (CSU,2008, Section

4.2.4). The high performer, on the other hand, adopted institutional arrangements that were not consistent with current cooperative legislation or proposed cooperative policy. This organisation issued non-redeemable, tradable and appreciable shares, assigned voting power in proportion to shareholding, did not restrict membership to natural persons, and permitted members to hold more than 20% of total shareholding. These institutional arrangements facilitated the equity-sharing partnerships that underpinned the high performer's success, but which also required it to register as a company rather than a cooperative. The answer to research question 4 is therefore a resounding 'yes' - changes to PNG's cooperative policy and legislation would certainly make it easier for cooperatives to achieve their intended business strategies.

The answer to research question 5 is that other factors did influence performance of the case studies. First, the low performer was more vulnerable to side selling owing to the presence of other local buyers. Second, product characteristics gave the high performer an advantage by providing flexibility in the timing of post-harvest processing. Third, the level of involvement of agencies that facilitated and financed the producer organisations differed. The high performer's business partners had a financial interest in the organisation and shared in its risk.

6.3. Recommendations

The recommendations offered in this section target PNG's policy makers, government and donor agencies involved in promoting cooperative development, and the directors and managers of cooperatives.

Producer organisations are more likely to attract strategic partners and benefit from their financial, human and intangible assets if horizon problems are fully addressed. This means investors should be able to realise market-related capital gains. PNG's cooperatives should therefore be allowed to issue non-redeemable, appreciable and tradable class B shares to patron and non-patron (i.e. external) investors. Membership should not be limited to natural persons, and there should be no ceiling on the number or proportion of class B shares purchased by any approved member. However, these shares should carry limited

voting rights. In New Zealand, external investors can nominate a maximum of 40% of the elected directors. In PNG, this might be extended to 50% to encourage equity partnerships with firms that agree to adhere to a code of ethical conduct. Such a code might permit patron directors to appoint a non-voting mentor to assist them at board meetings, and require strategic partners to provide certified valuations of tangible and intangible assets offered as equity capital. It is also recommended that restrictions preventing patron members from nominating and electing competent outsiders as their directors should be scrapped.

Cooperatives should also be allowed to decide whether voting rights assigned to patron members are democratic or proportional to investment. Governance arrangements that do not assign democratic or investment proportional voting rights, do not embed sound electoral procedures, or – most importantly – do not centralise decision making in the hands of accountable directors and managers should not be promoted in policy or provided for in legislation.

Cooperative efforts to build supply relationships with premium buyers adversely affected when members side sell to competitors. Members are more likely to honour supply contracts with cooperatives when their incentives as investors and patrons are well-aligned, and they can realise future benefits from compliance. Legalising class B shares would allow cooperatives to offer these shares to patrons as tradable delivery rights. If cooperatives raise equity capital by selling delivery rights rather than membership shares, they would not only encourage patron investment and discourage side selling, but would also reduce their exposure to redemption risk. On the other hand, if cooperatives issue rather than sell these delivery rights to producers, they should allocate the rights in proportion to producer investment in membership shares. That is, the delivery rights should remain tied or 'stapled' to shareholding so that producers cannot sell (buy) these rights without redeeming (purchasing more) membership shares. If cooperatives transact with producers who are not shareholders, they should discount prices paid for their produce, and charge a premium for for services rendered.

Donor and government agencies should extend the financial and logistical support currently provided to cooperatives to other types of producer organisation, like producer-owned companies and unitised trusts. This would create more opportunities for smallholders to leverage financial and human capital from strategic partners and commercial lenders.

6.4. The study's contribution, limitations, and future research

This study contributed evidence-based recommendations for policy and legislation in PNG that provide agricultural marketing cooperatives with greater flexibility in the structures they can adopt to support value adding strategies. Moreover, it contributes to the limited literature on cooperative performance, institutions and governance in PNG after the reintroduction of cooperatives in 2000.

This study was limited to two producer organisations. Although these two organisations provided rich variation in performance and institutional arrangements, it would have been interesting to examine other cooperatives involved in value adding, especially those engaged in niche markets. Furthermore, this research used case study methodology and the results cannot be generalised to the population of cooperatives and producer companies. Future studies should consider larger samples and the possibility of quantitative analysis. A specific area of interest for future study is the impact of customary governance arrangements on the performance of cooperatives.

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Appendices

Appendix 1. Research information sheet

I would like to invite you to participate in my Lincoln University research project. I am a Masters of Commerce (Agribusiness) student researching existing and proposed institutional and governance arrangements for agricultural marketing cooperatives in Papua New Guinea (PNG).

You have been chosen to participate because you are involved in an agricultural cooperative and so can provide useful insights into existing cooperatives in PNG. This research is important because it will help improve legislation and policy on cooperative societies in PNG.

I would like to interview you on the 25th of November 2016. This interview will require about one hour of your time. You will be asked questions relating to the rules governing your cooperative and its implication on the business activities. Please be informed that questions relating to your financial dealings with the cooperative will asked. This information will remain confidential and your privacy will be maintained at all times.

To ensure that I can collect information accurately, I would like to audio record the interview. However, if you are uncomfortable with my recording the interview, please let me know and only notes will be taken.

Your participation is completely voluntary and you may withdraw your consent to participate at any time.

Information from interviews will be used to write up my Master's thesis and possibly used in a conference presentation and conference paper. However, your identity will remain anonymous, as you will be referred to in my notes, the recordings and the final thesis report as Participant One or similar. To protect your confidentiality, all recordings and notes taken during the interview will kept in a secure Lincoln University file and will only be accessed by me, my supervisors and Human Ethics Committee for audit purposes.

If you have any queries or concerns about this research, please contact me or my supervisor:

Researcher: Naomi Mwayawa, Faculty of Agribusiness and Commerce, Lincoln University, New Zealand.
Email: Naomi. Mwayawa@lincolnuni.ac.nz

My supervisor: Nic Lees, Faculty of Agribusiness and Commerce, Lincoln University, Christchurch, New Zealand.
Email: Nic.Lees@lincoln.ac.nz

Appendix 2. Consent form

I give my consent to participate in this research project. I have read and understood the details and the nature of the research project, and I agree to participate in the interview. This is with the understanding that my participation is voluntary and that I am free to withdraw from this study at any time.

I also understand that my privacy will be maintained and information that I provide will be stored securely at Lincoln University.

Please indicate below whether or not you wish the interview to be audio recorded:

- ☐ I agree to have my interview audio recorded.
- ☐ I do not agree to have my interview recorded, but agree to notes taken.

If you have any queries or concerns about this research, or want further information, please contact my supervisor or me:

Researcher: Naomi Mwayawa, Faculty of Agribusiness and Commerce, Lincoln University, New Zealand.
Email: Naomi. Mwayawa@lincolnuni.ac.nz

My supervisor: Nic Lees, Faculty of Agribusiness and Commerce, Lincoln University, Christchurch, New Zealand.
Email: Nic.Lees@lincoln.ac.nz
Phone:

Name:_____

Signature: _____

Date: _____

Position in the organisation :_____

Appendix 3. Interview schedule

Interviews with directors and managers

1. ***Details of the producer organisation***
    a. Date and nature of incorporation or registration
    b. Founding members
    c. History- successes and failures
    d. Size of shareholdings
    e. Number of shareholders
    f. Mission and vision statements
    g. Financial status/performance in the last three years
    h. Debt acquisition/repayments
2. ***Business strategy***
    a. Current operation of the organisation
        i. Products (multiple or single) /services provided
        ii. Processing
        iii. Financial capacity
        iv. Buyers and relationship with buyers
        v. Assets (acquisition and maintenance), brand , patents
    b. Description of value adding activities
    c. Strategic gap- achievement of goals, mission and visions stated above
    d. Constraints to achieving these goals, missions and visions
3. ***Institutional arrangements***
    a. Active market for shares
    b. Nature of shares- non-redeemable, appreciable, tradable
    c. Classes of classed
    d. Dividends, bonus shares, rebates
    e. Revaluation of shares
    f. Benefit rights of shares offered to members and non-members (in the case of producer companies)
    g. Members' willingness to provide equity capital
    h. Members' preference for short term benefits
    i. Members' willingness to reinvest

j. Organisation's ability to retain profits
k. Members' loyalty
l. Shareholding- patronage relationships
m. Voting rights – voting and shareholding relationship

4. Governance arrangements

a. Duties, authority and composition of BoD
b. Nomination of directors
c. External representatives
d. Off-farm skills and knowledge of directors
e. Skills and experience of managers
f. Participation of members in decision making
g. Election procedures
h. Procedures of meeting and conducting of annual general meetings
i. Circulation of reports/notice/ minutes of meetings
j. Audits
k. Budget approval

5. Other factors

a. Government subsidies and support
b. Donor agency support
c. Industry performance
d. Commodity prices
e. Geographical location
f. Strategic alliances

Interview with members

1. Details of membership

a. History of membership
b. Background on farming operations
c. Size of shareholdings
d. Particulars of patronage

2. Strategy

a. Current operation of the organisation
    i. Products (multiple or single) /services provided

ii. Processing
iii. Financial capacity
iv. Buyers and relationship with buyers
v. Assets (acquisition and maintenance), brand , patents

a. Organisation's goals, mission and vision
b. Observations on the organisation's ability to achieved its goals vision and mission

3. Institutional Arrangements

a. Nature of shares- non-redeemable, appreciable, tradable, classes
b. Benefits received from the organisation
    i. Favourable prices
    ii. Capital gains
    iii. Bonus shares
    iv. Rebates
    v. Dividends
b. Willingness to provide equity capital
c. Limitations in investing
d. Preference for short term benefits
e. Willingness to reinvest
f. Organisation's ability to retain profits
g. Loyalty to organisation
h. Shareholding- patronage relationships
i. Voting rights – voting and shareholding relationship

4. Governance Arrangements

a. Member participation in decision making
b. Election procedures
c. Procedures of meeting and conducting of annual general meetings
d. Circulation of reports/notice/ minutes of meetings
e. Nomination of directors
f. External representatives
g.

5. Other factors

g. Government subsidies and support

h. Donor agency support

i. Industry performance

j. Commodity prices

k. Geographical location

l. Strategic alliances